



Republic of Lebanon
Council for Development and Reconstruction

BRISSA DAM AND RESERVOIR
Full Lining and Additional Water Diversion - Caza of Danniyeh

Tender Documents
Drawings - Volume IV

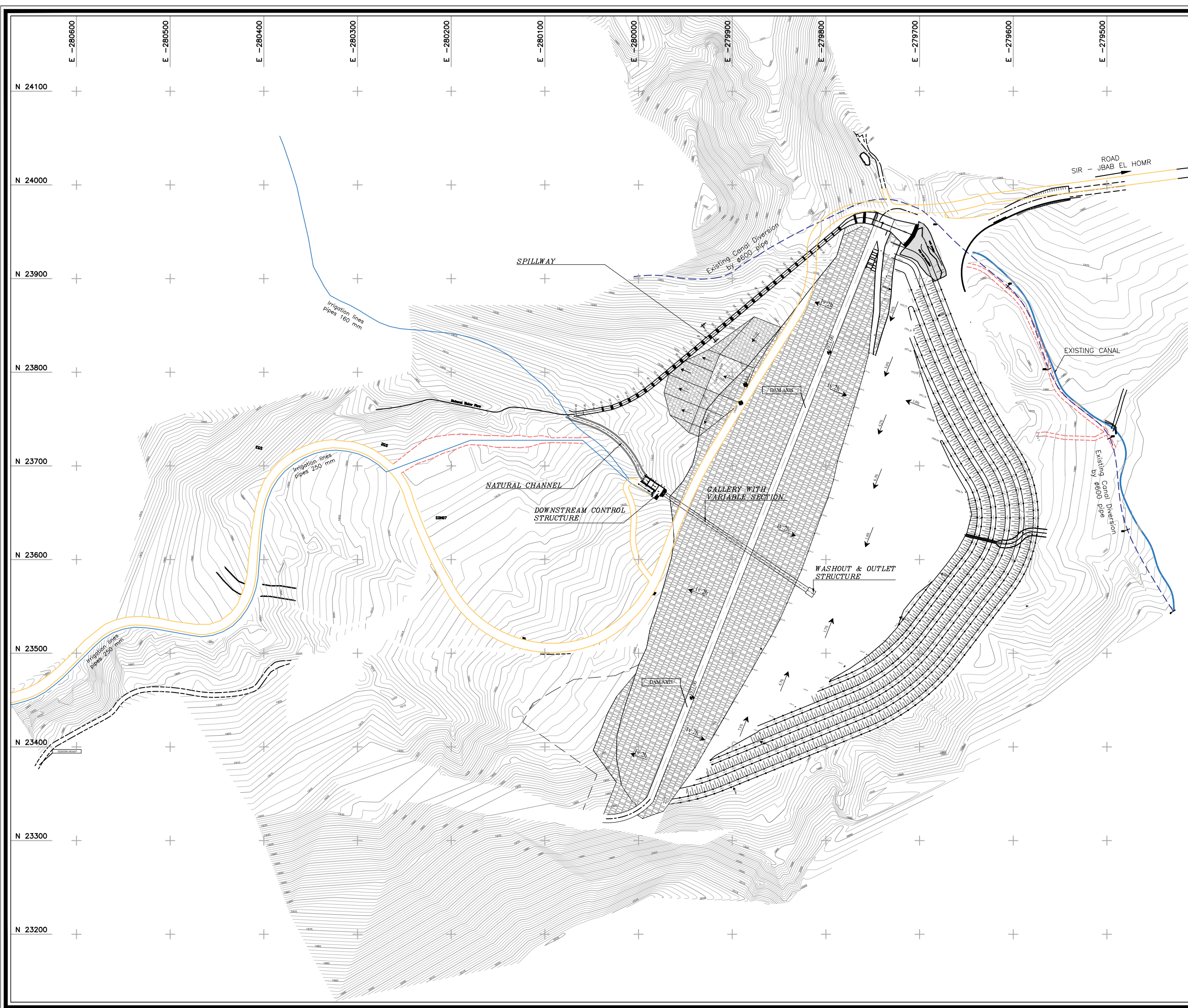


DAR AL HANDASAH NAZIH TALEB & PARTNERS
دار الهندسة نزيه طالب وشركاه

GENERAL PLANS

BRISSA DAM & RESERVOIR			
FULL LINING AND ADDITIONAL WATER DIVERSION			
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REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION							
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION							
<div><div><div></div><div>Founded 1990</div></div><div>DAR AL HANDASAH NAZH TALEB & PARTNERS دار الهندسة نزيه طالب وشركاه</div></div>							
GENERAL PLANS					DRAWN : ---		
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					APPROVED : ---		
					DATE : Jan 2024		
List of Drawings					SCALE : NTS		
					FILE NAME		
					BDR--LOD--00.dwg		
PROJECT	DIVISION	SUB-DIVISION	SHEET		REVISION		
L0305S	BDR	LOD	00		0		



- LEGEND**
- Contour Line Every 5m.
 - Contour Line Every 1m.
 - Existing Road
 - Existing Natural Road

No	DATE	REVISIONS	ARCH	CIVIL	MECH	ELEC

REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT
AND RECONSTRUCTION

BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL
WATER DIVERSION

DAR AL HANDASAH NAZIH TALES & PARTNERS
دار الهندسة نزيه طالب وشركاه
Founded 1998

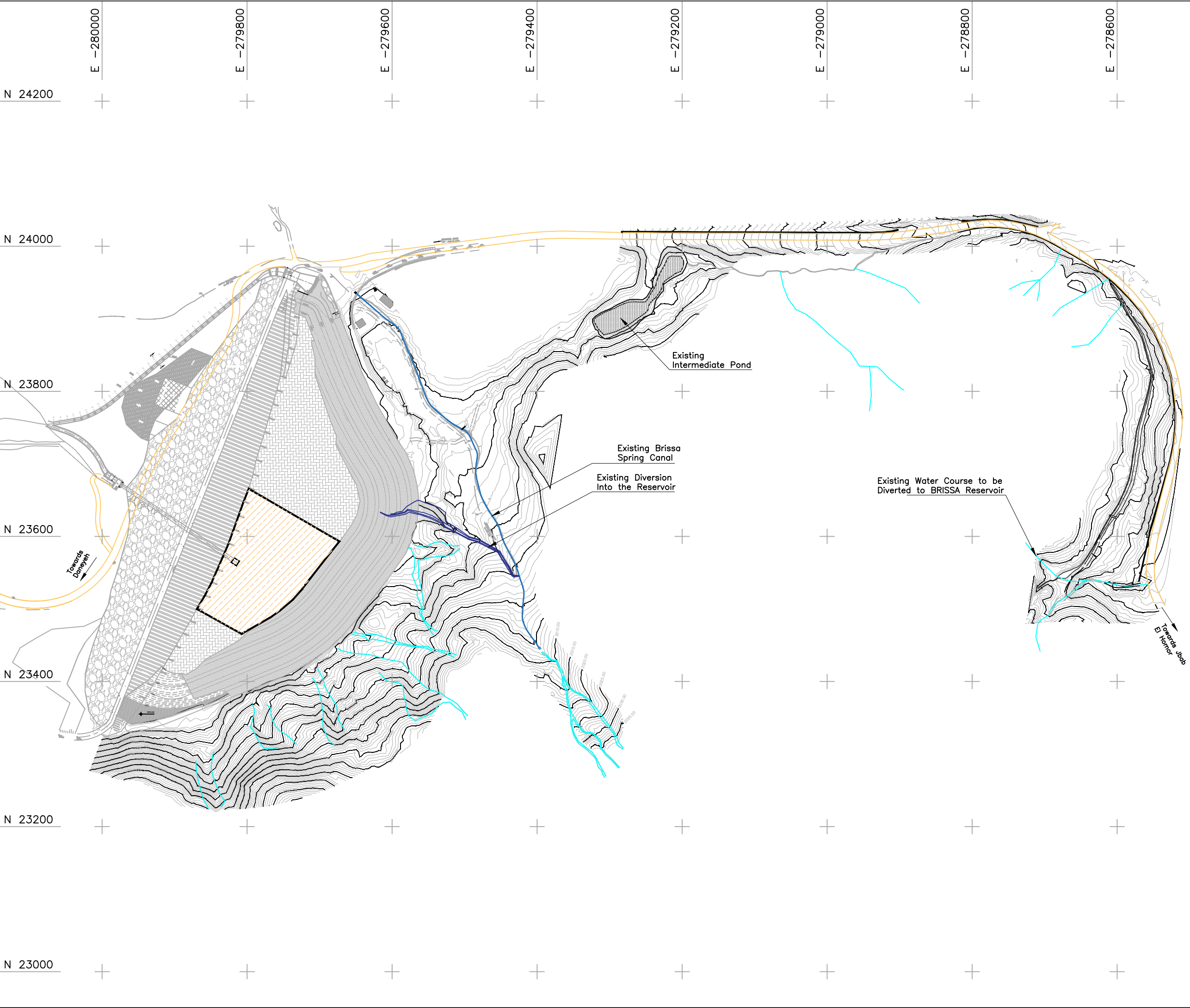
GENERAL PLAN
(1/3)

Dam As Built Status
Plan View

PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION
L0305S	BDR	GP-AB	100	0

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FILE NAME
BDR-GP-AB-100.dwg



LEGEND

- Contour Line Every 5m.
- Contour Line Every 1m.
- Existing Water Course
- EXISTING LINING
- Existing Road

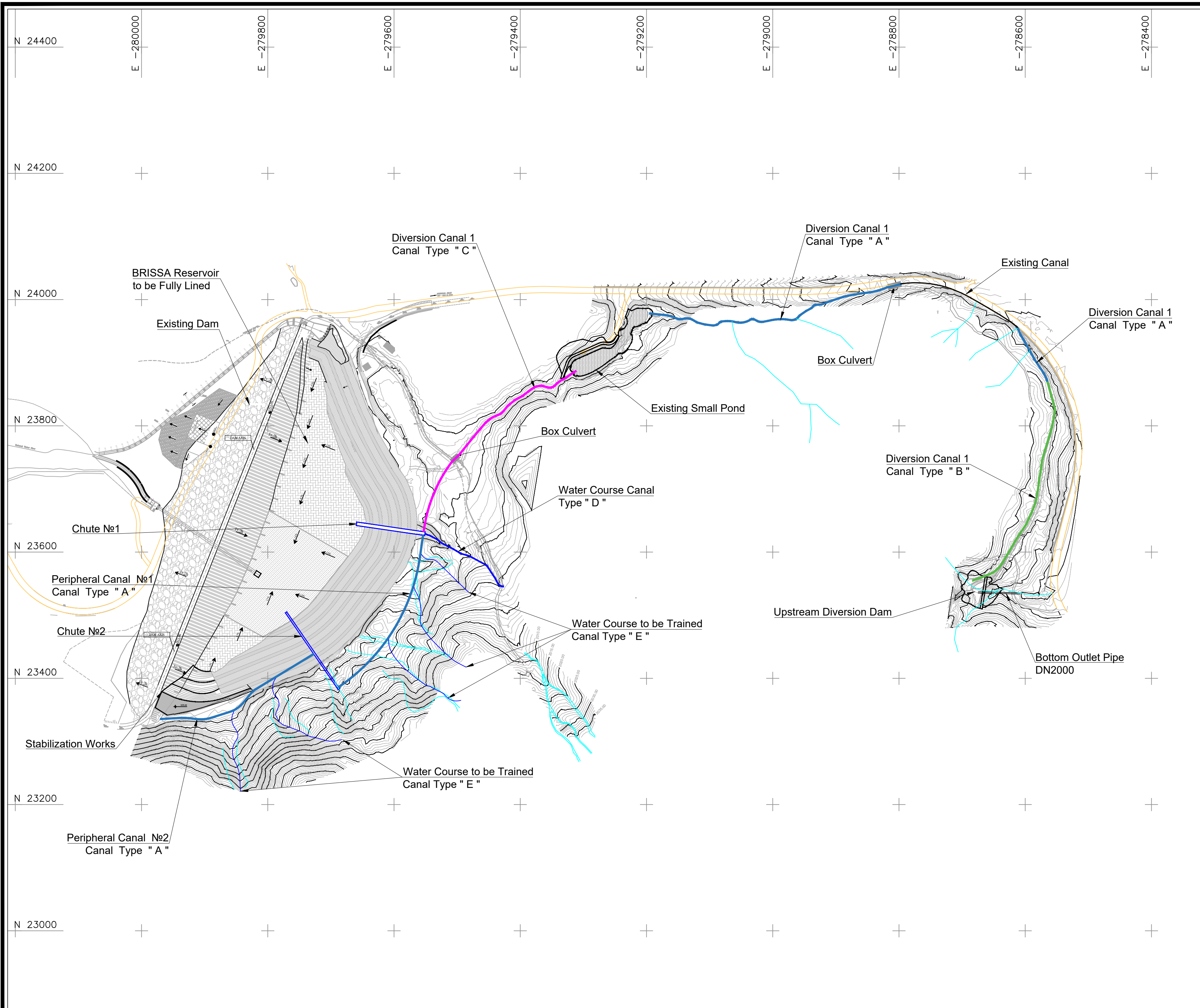
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REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT
AND RECONSTRUCTION

BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL
WATER DIVERSION

DAR AL HANDASAH NAZH TALES & PARTNERS
دار الهندسة نزيه طالب وشركاه

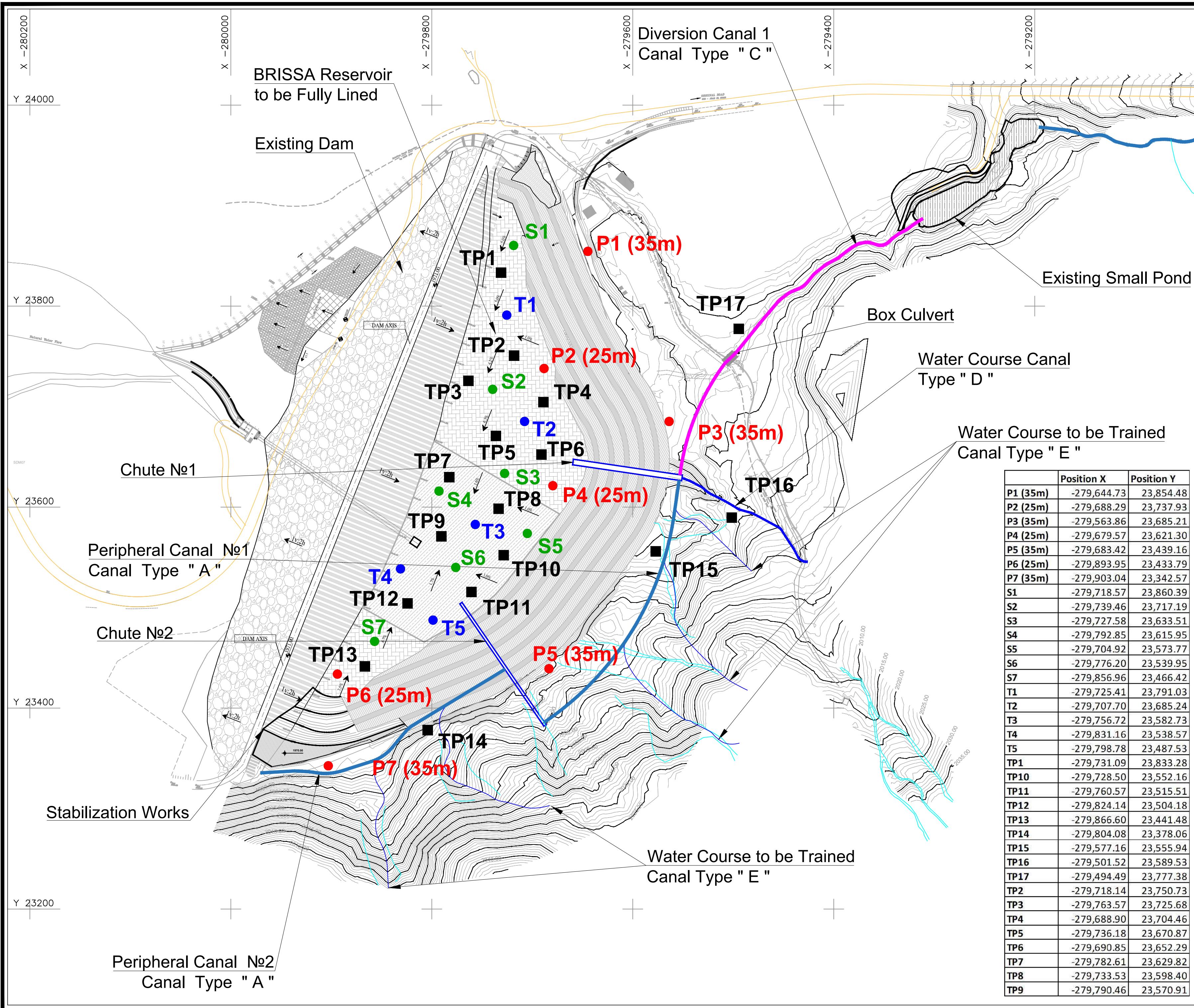
GENERAL PLAN (2/3)	DRAWN : ---			
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	APPROVED : ---			
	DATE : Jan 2024			
Dam and Surrounding Water Courses	SCALE : NTS			
	FILE NAME			
PROJECT			SHEET	
L0305S			101	
DIVISION			REVISION	
BDR			0	
SUB-DIVISION				
GP-DWC				



LEGEND

- Contour Line Every 5m.
- Contour Line Every 1m.
- Proposed Canal (Type A)
- Proposed Canal (Type B)
- Proposed Canal (Type C)
- Existing Water Course
- Existing Road

No	DATE	R E V I S I O N S				ARCH	CIVIL	MECH	ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION									
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION									
 DAR AL HANDASAH NAZIH TALEB & PARTNERS دار الهندسة نزيه طالب وشركاه									
GENERAL PLAN (3/3)						DRAWN : --- CHECKED : --- APPROVED : --- DATE : Jan 2024 SCALE : 1/4,000			
Proposed Works						FILE NAME BDR-GP-PW-102.dwg			
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION					
L0305S	BDR	GP-PW	102	0					



LEGEND

- Contour Line Every 5m.
- Contour Line Every 1m.
- Proposed Canal (Type A)
- Proposed Canal (Type B)
- Proposed Canal (Type C)
- Existing Water Course
- Existing Road

NOTES

The Primary Boreholes (P), TP14 (Test Pit No.14), TP15, TP16 and TP17 will be executed by the Contractor during the preparation of shop drawings, to validate the tender design for Chutes (No.1 and No.2), Periphery Canals (No.1 and No.2), Diversion Canal No.1 (Type C), Slope Stabilization (Left Abutment) and Full Lining (Reservoir Bottom and Slopes with/without Berms),

The Secondary (S, 25m deep each) and Tertiary (T, 25m deep each) Boreholes as well as TP1 to Tp13 will be executed by the Contractor upon completion of geophysical survey (cavity and sinkhole-development detection) to confirm the anomalies (potential cavities and/or sinkhole-developments), accordingly; the locations of S and T boreholes as well as TP1 to TP13 will be adjusted according to anomalies encountered during the geophysical survey, and

The S and T boreholes (with or without confirmation of cavity / sinkhole-development) will be grouted until refusal, to avoid any weak spot for Full Lining,

The TPs will be excavated until reaching the rock-head and/or sinkhole-development (if any) for inspections and sampling (if needed), the TPs (with or without confirmation of cavity / sinkhole-development) will be filled with Concrete Class D,

The number of Boreholes (Secondary and Tertiary) and Test Pits might be increased by the Engineer during the execution according to geophysical findings (number of anomalies encountered) and actual site conditions,

The Engineer may also ask for further and deeper geophysical survey (in addition to principal one to be conducted by the Contractor) within the areas where the major anomalies (potential cavities and/or sinkhole development) were encountered,


The GRP (Ground Penetration Radar) is an electromagnetic geophysical method, and its depth of investigation is site-specific and depends on antenna's transmitting frequency. The depth of investigation will be defined by the Contractor, however; it shall in no case be less than 7.5m (sufficient very poor to poor rock-mass cover for a cavity 2.5m in diameter). Accordingly, the electromagnetic method (GPR) may be replaced with any other method by the Contractor (after taking the approval of the Engineer), if found necessary,

The works shall be executed according to Technical Specifications - Volume II / Part VI & Part VII and/or as directed by the Engineer.

	Position X	Position Y
P1 (35m)	-279,644.73	23,854.48
P2 (25m)	-279,688.29	23,737.93
P3 (35m)	-279,563.86	23,685.21
P4 (25m)	-279,679.57	23,621.30
P5 (35m)	-279,683.42	23,439.16
P6 (25m)	-279,893.95	23,433.79
P7 (35m)	-279,903.04	23,342.57
S1	-279,718.57	23,860.39
S2	-279,739.46	23,717.19
S3	-279,727.58	23,633.51
S4	-279,792.85	23,615.95
S5	-279,704.92	23,573.77
S6	-279,776.20	23,539.95
S7	-279,856.96	23,466.42
T1	-279,725.41	23,791.03
T2	-279,707.70	23,685.24
T3	-279,756.72	23,582.73
T4	-279,831.16	23,538.57
T5	-279,798.78	23,487.53
TP1	-279,731.09	23,833.28
TP10	-279,728.50	23,552.16
TP11	-279,760.57	23,515.51
TP12	-279,824.14	23,504.18
TP13	-279,866.60	23,441.48
TP14	-279,804.08	23,378.06
TP15	-279,577.16	23,555.94
TP16	-279,501.52	23,589.53
TP17	-279,494.49	23,777.38
TP2	-279,718.14	23,750.73
TP3	-279,763.57	23,725.68
TP4	-279,688.90	23,704.46
TP5	-279,736.18	23,670.87
TP6	-279,690.85	23,652.29
TP7	-279,782.61	23,629.82
TP8	-279,733.53	23,598.40
TP9	-279,790.46	23,570.91

REPUBLIC OF LEBANON
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AND RECONSTRUCTION

BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL
WATER DIVERSION



DAR AL HANDASAH NAZH TALEB & PARTNERS
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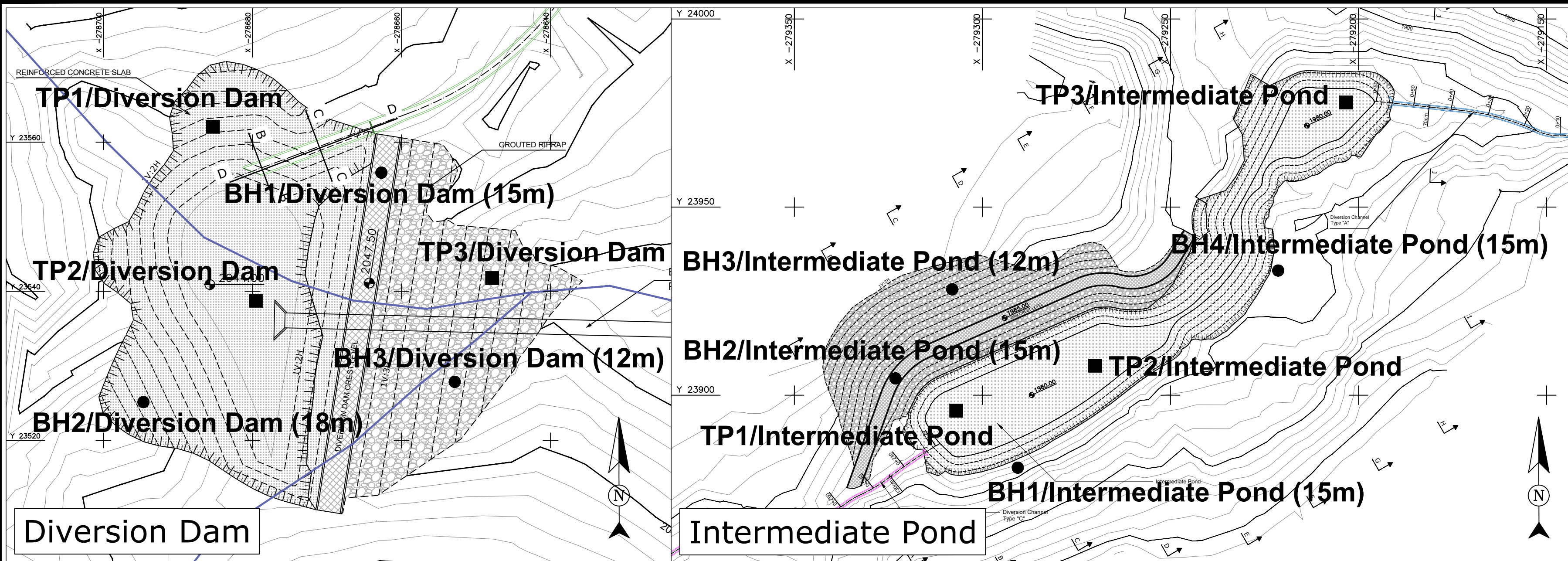
GENERAL PLAN
(4/5)

Proposed Geotechnical
Works for Dam & Reservoir

DRAWN :
CHECKED :
APPROVED :
DATE : Jan 2024
SCALE : 1/2,500

FILE NAME
BDR-GP-GW-103.dwg

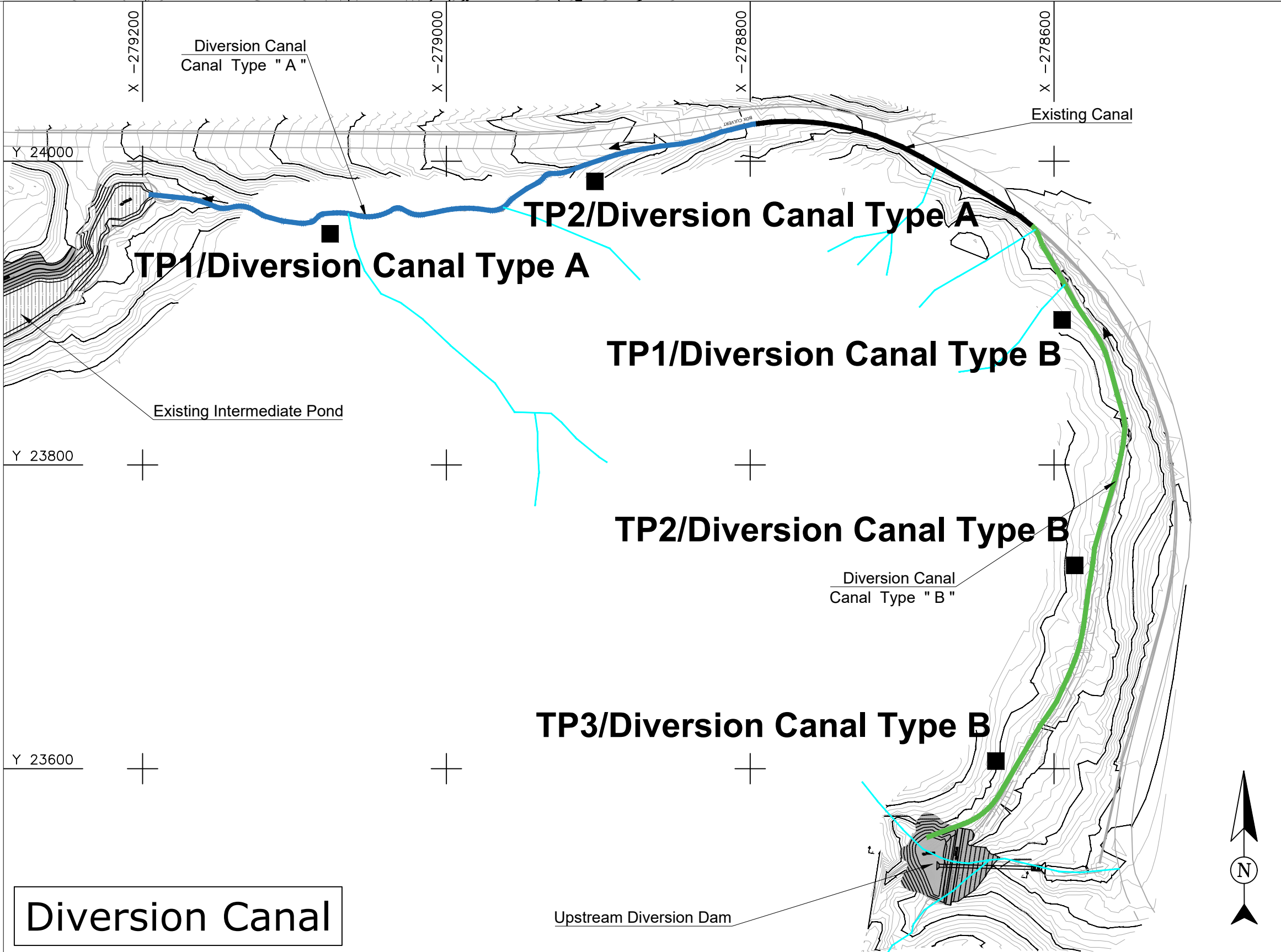
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION
L0305S	BDR	GP-GW	103	0




LEGEND

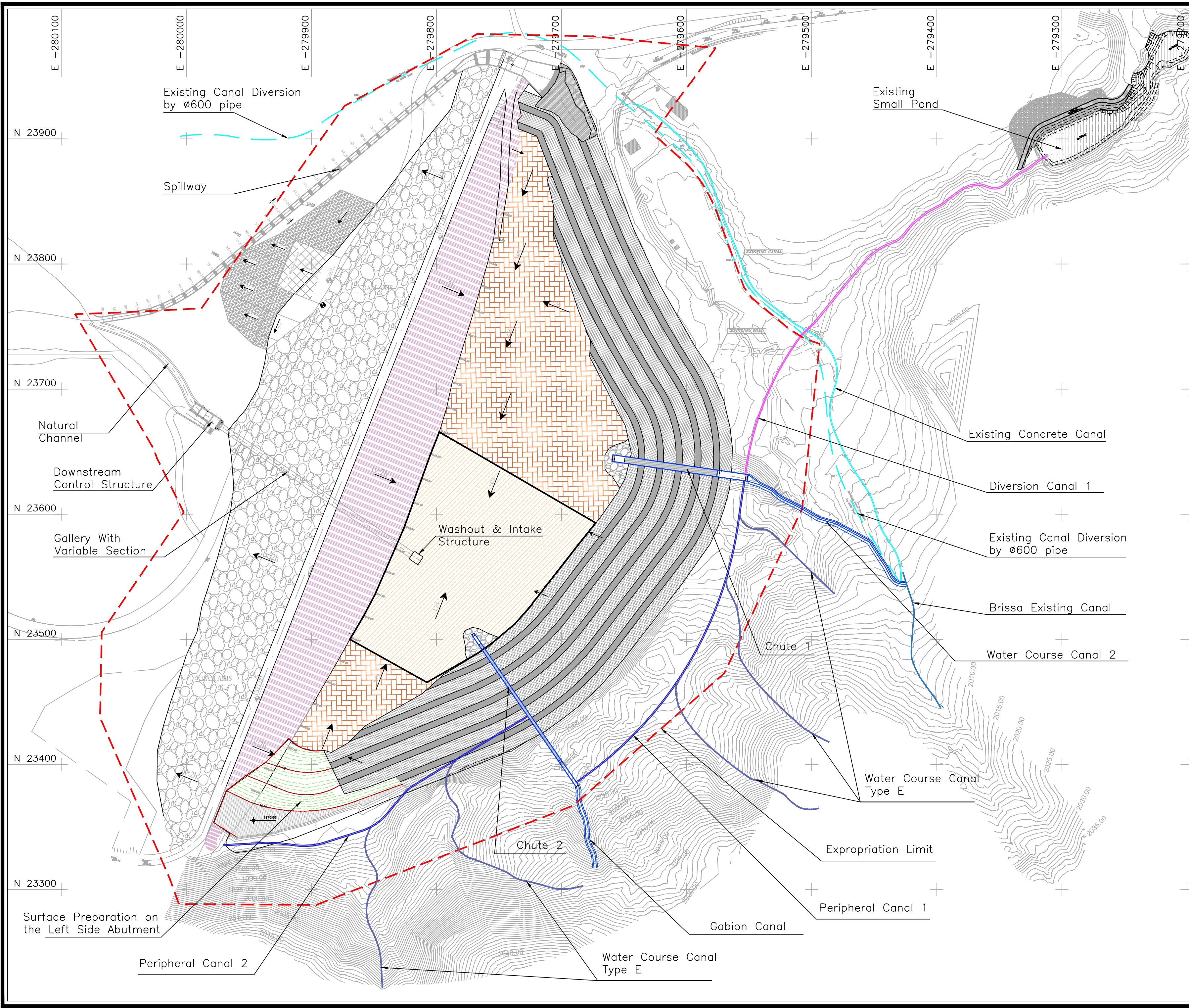
- Contour Line Every 5m.
- Contour Line Every 1m.
- Proposed Canal (Type A)
- Proposed Canal (Type B)
- Proposed Canal (Type C)
- Existing Water Course

	Position X	Position Y
TP1/Diversion Canal Type A	-279,076.53	23,952.24
TP2/Diversion Canal Type A	-278,902.21	23,986.76
TP1/Diversion Canal Type B	-278,594.64	23,895.52
TP2/Diversion Canal Type B	-278,586.38	23,733.87
TP3/Diversion Canal Type B	-278,638.26	23,605.00
TP1/Diversion Dam	-278,685.30	23,562.07
TP2/Diversion Dam	-278,679.54	23,538.73
TP3/Diversion Dam	-278,647.85	23,541.78
BH3/Diversion Dam (12m)	-278,652.86	23,527.85
BH1/Diversion Dam (15m)	-278,662.70	23,555.92
BH2/Diversion Dam (18m)	-278,694.62	23,525.14
TP1/Intermediate Pond	-279,306.98	23,895.88
TP2/Intermediate Pond	-279,270.05	23,907.84
TP3/Intermediate Pond	-279,203.32	23,977.81
BH3/Intermediate Pond (12m)	-279,308.04	23,928.14
BH1/Intermediate Pond (15m)	-279,290.60	23,880.74
BH2/Intermediate Pond (15m)	-279,323.13	23,904.47
BH4/Intermediate Pond (15m)	-279,221.37	23,933.14



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REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION									
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION									
 DAR AL HANDASAH NAZIH TALEB & PARTNERS دار الهندسة نزيه طالب وشركاه									
GENERAL PLAN (5/5)									
Proposed Geotechnical Works for Additional Water Diversion System, Upstream Diversion Dam and Intermediate Pond									
DRAWN : --- CHECKED : --- APPROVED : --- DATE : Jan 2024 SCALE : N.T.S.									
FILE NAME BDR-GP-GW-104.dwg									
PROJECT L0305S	DIVISION BDR	SUB-DIVISION GP-GW	SHEET 104	REVISION 0					

DAM AND RESERVOIR FULL LINING SYSTEM



LEGEND:

- LINING DETAIL "A"
- LINING DETAIL "B"
- LINING DETAIL "C"
- EXISTING LINING
- RIP RAP
- Inflow Control System
- Additional Water Diversion

- NOTES:**
- Existing lining may be kept or replaced by a proposed new lining subject to the type of the new lining as to be instructed by the Engineer
 - Surface preparation of the upstream face of the dam: Concrete treatment to smooth the surface and eliminate any sharp protruding blocs penetrating the protection by almost 80cm.
 - Surface preparation on the left side abutment: Compacted embankment made of a continuous gradation, non-plastic, material watered and compacted in layers of less than 50cm thickness.
 - Surface preparation of the walls of the reservoir: Smoothing either by removing protruding zones or by concreting or backfilling using non-plastic continuous gradation compacted material.
 - Surface preparation of the floor of the reservoir: Smoothing by motor grader work after removing all blocs setting on the surface.
 - Surface preparation of the area which is already covered with the PVC membrane complex: Preparation to be defined by the Contractor in his proposal concerning mainly the bubbles' zone and the boundaries and the connection of the new membrane with the existing one.
 - Membrane Complex: To be proposed by the Contractor. Made of multiple layers providing watertightness and resistance to punching and weather agents and Waves (if Exposed).
 - Eventual Physical Protection of the membrane on the slopes: To be proposed by the Contractor. Against Vandalism, Waves and Weather Agents.
 - Physical Protection of the membrane at the bottom of the reservoir: 50cm fill protection.

No	DATE	REVISIONS	ARCH	CIVIL	MECH	ELEC

REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION

BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL WATER DIVERSION

DAM & RESERVOIR
FULL LINING SYSTEM

Proposed Lining System
Plan View

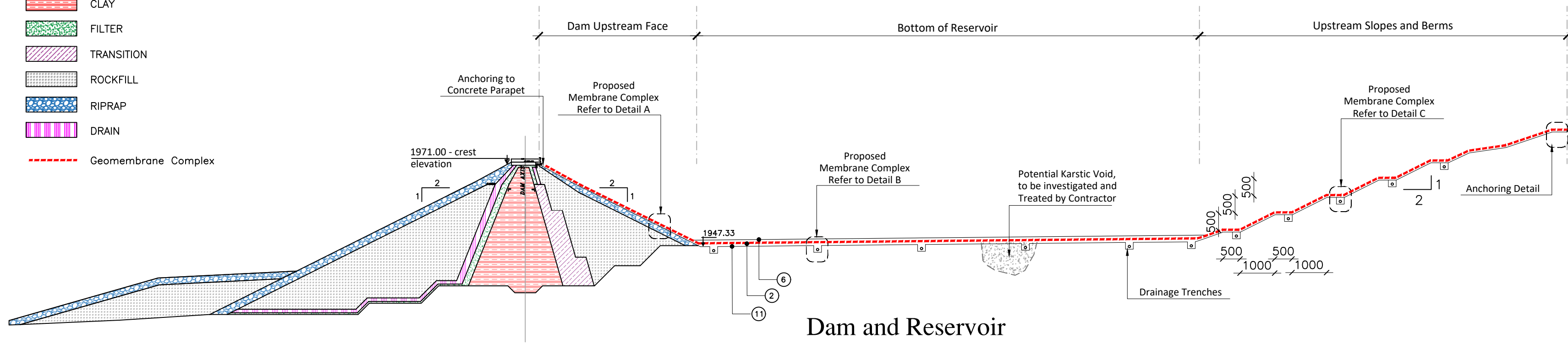
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION
L0305S	FLS	PLS	PV-101	0

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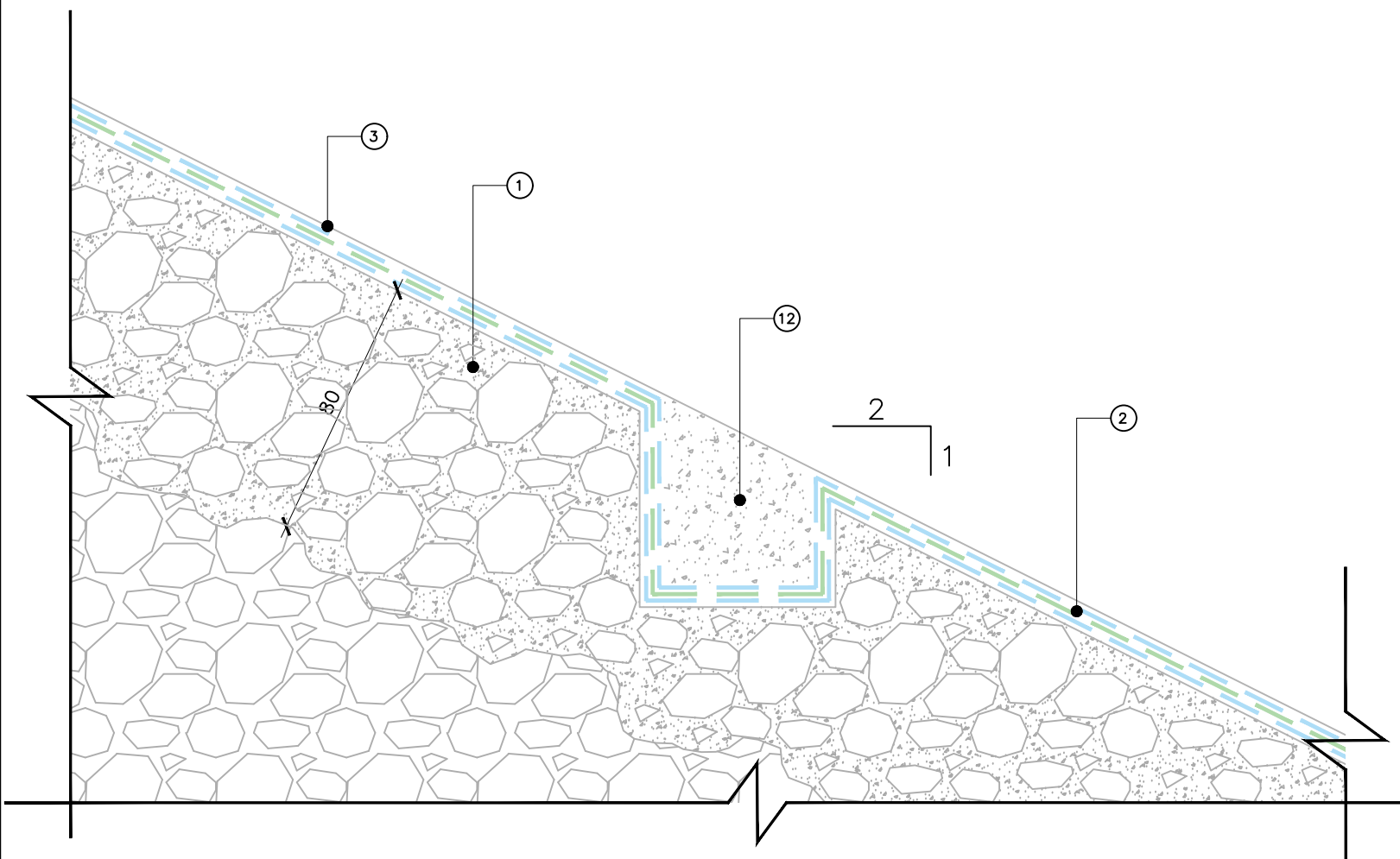
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DATE : Jan 2024
SCALE : 1/2000

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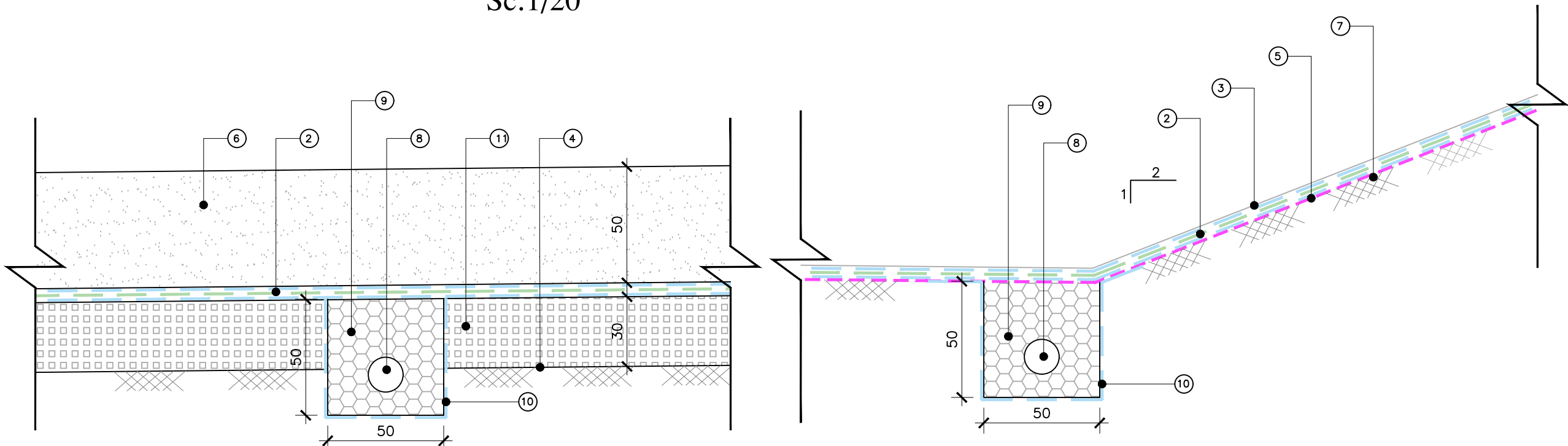
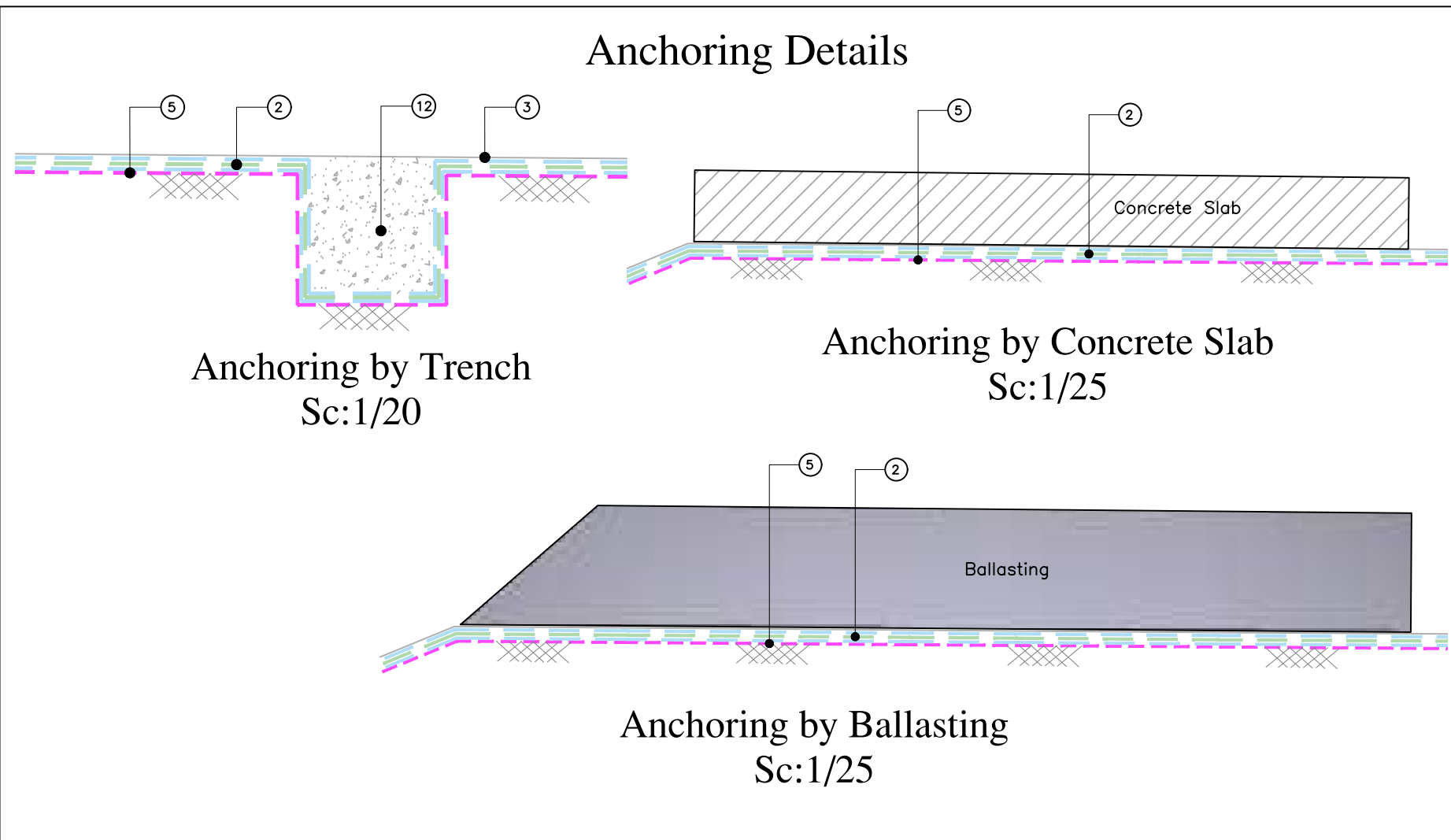
- LEGEND :
- CLAY
 - FILTER
 - TRANSITION
 - ROCKFILL
 - RIPRAP
 - DRAIN
 - Geomembrane Complex



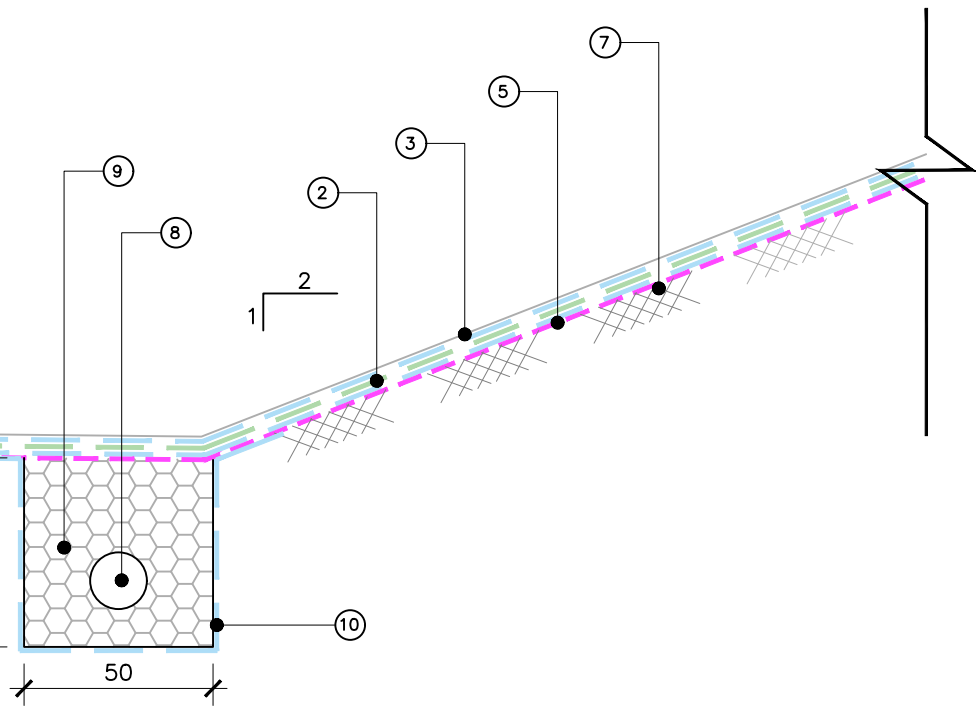
Dam and Reservoir
Typical Section
Sc:1/1000



Detail A
Sc:1/20



Detail B
Sc:1/20



Detail C
Sc:1/20

LEGEND :

- Surface preparation of the upstream face of the dam: Porous Concrete treatment to smooth the surface and eliminate any sharp protruding blocs penetrating the protection by almost 80cm.
- Geomembrane Complex: To be proposed by the Contractor. Made of multiple layers providing watertightness and resistance to punching and weather agents and Waves (if Exposed).
- Eventual Upper Protection Physical Protection of the membrane on the slopes: To be proposed by the Contractor (If Needed). Against UV, Winds and Waves.
- Surface preparation of the floor of the reservoir: Smoothing by motor grader work after removing all blocs setting on the surface.
- Eventual Lower Protection and Drainage Sheet (If Needed), Based on the Membrane Selected Type.
- Physical Protection of the Membrane at the Bottom of the Reservoir : 50cm Fill Protection
- Surface preparation of the walls of the reservoir: Smoothing either by removing protruding zones or by concreting or backfilling using non-plastic continuous gradation compacted material.
- Perforated PVC Pipe.
- Drainage Material.
- Geotextile Sheet.
- Drainage and Transition Layer.
- Concrete.

NOTES :

- Lower and Upper Protection can be Eliminated, if the Membrane is Proven to Withstand all the Weather agents and Foundation Conditions.
- It is Mandatory to have a Drainage System in the Reservoir Bottom Consisting of Drainage Material Layer and Drainage Trenches or Slopes, Drainage System Consist of drainage Trenches Network and any Necessary Drainage System Under the Membrane (Lower Protection) if Judged Necessary for the Membrane Protection.
- The Physical Protection of the Membrane is to be installed only in the Accessible Zones (Against Vandalism) and as Instructed by the Engineer.
- Anchoring is Mandatory on the Peripheries Some of the Waterproofing System. However for Some Types of Membrane and in absence of the Physical Protection, It is Required to be have anchoring in Other Places, as Requested by the Supplier .

No	DATE	R E V I S I O N S	ARCH	CIVIL	MECH	ELEC

REPUBLIC OF LEBANON
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AND RECONSTRUCTION

BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL
WATER DIVERSION



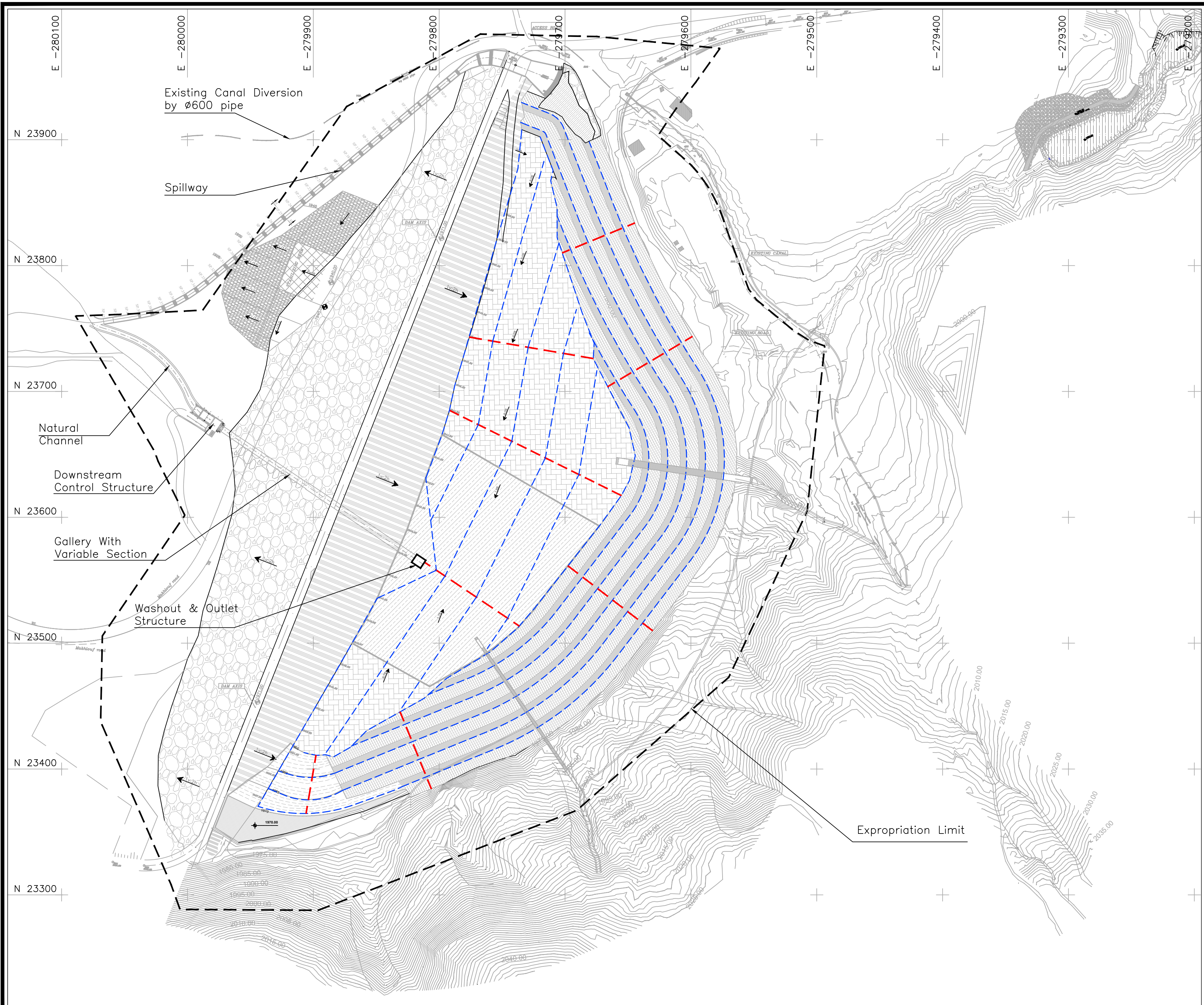
DAR AL HANDASAH NAZH TALES & PARTNERS
دار الهندسة نزيه طالب وشركاه

DAM & RESERVOIR
FULL LINING SYSTEM


Proposed Lining System
Typical Sections

PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION
L0305S	FLS	PLS	TS-201	0

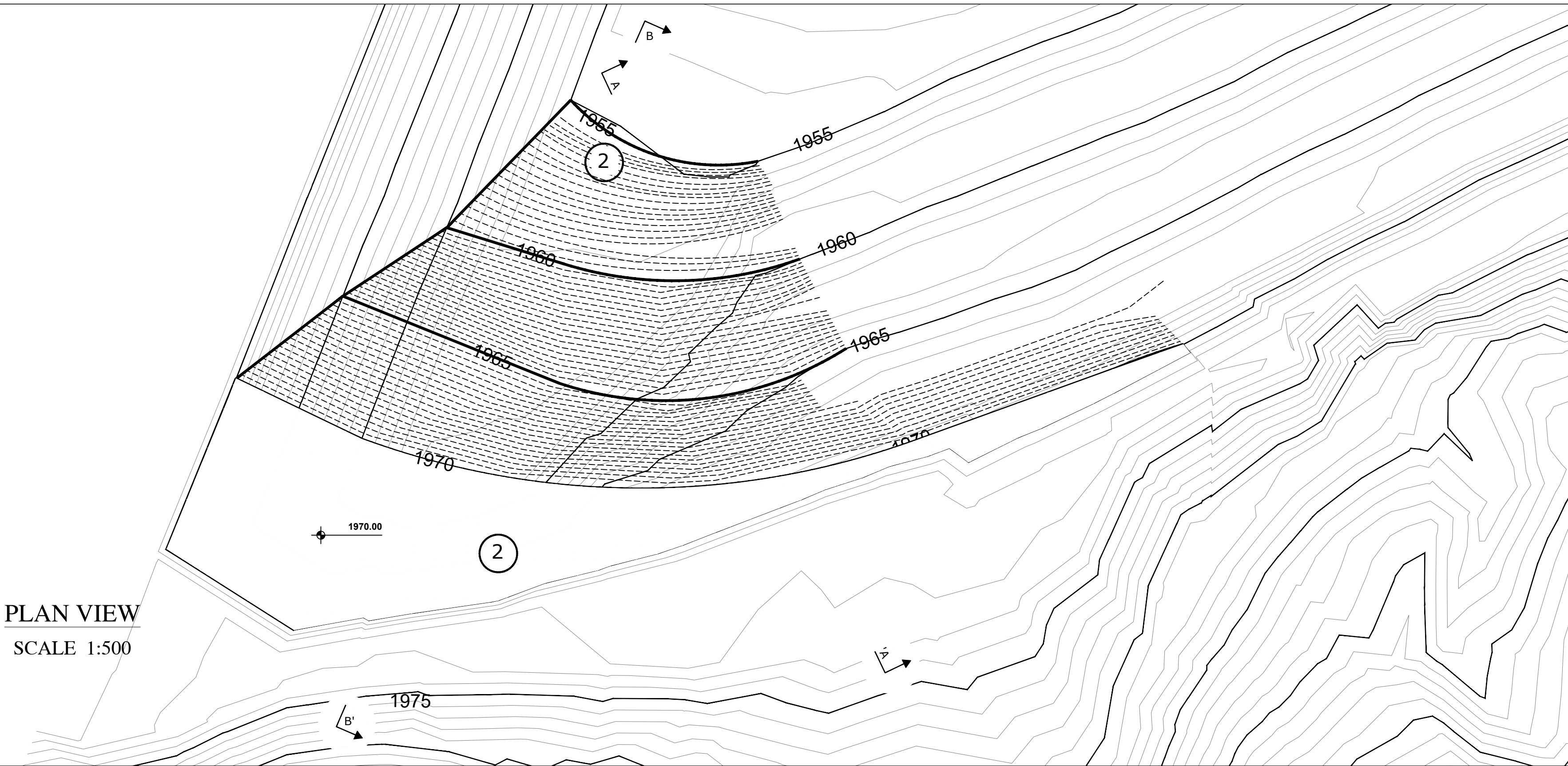
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DATE : Jan 2024
SCALE : 1/1000
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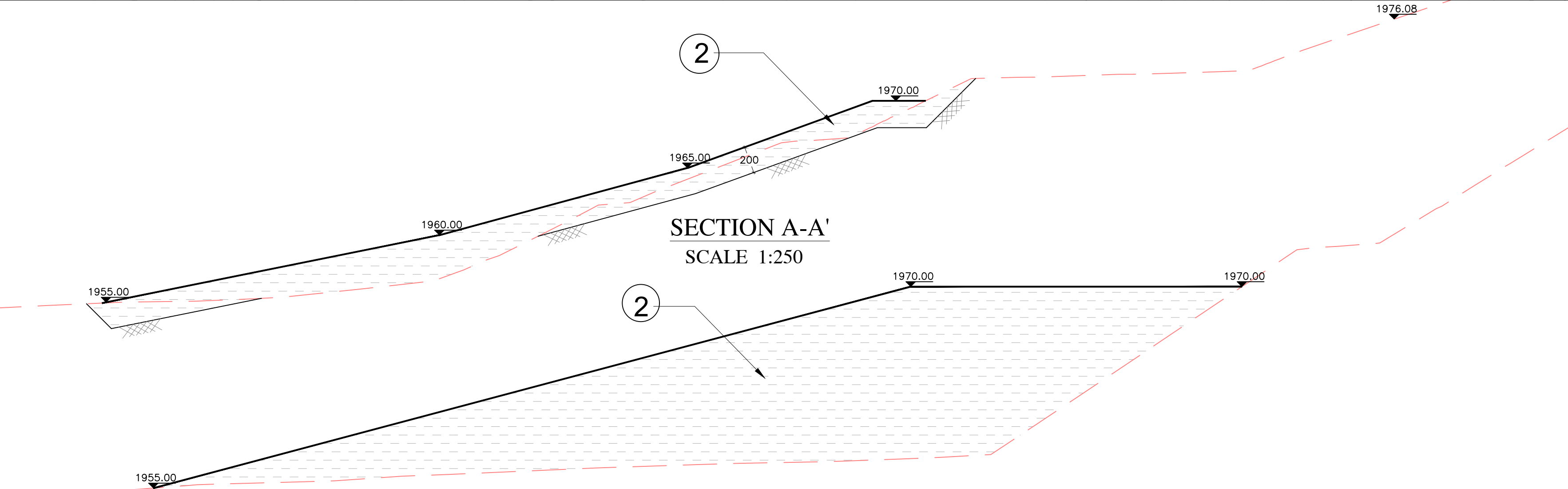
- LEGEND:**
- Longitudinal Drainage Trench
 - Transversal Drainage Trench
- NOTE:**
- The Proposed Drainage System Shown on this Drawing is Indicative.
 - Contractor to Propose a Drainage System Based on Calculation and Verification to be Submitted with Detailed Design, Subjects to the Engineer Approval.

No	DATE	R E V I S I O N S			ARCH	CIVIL	MECH	ELEC
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BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION								
 DAR AL HANDASAH NAZH TALEB & PARTNERS دار الهندسة نزيه طالب وشركاه								
DAM & RESERVOIR FULL LINING SYSTEM				DRAWN : --- CHECKED : --- APPROVED : --- DATE : Jan 2024 SCALE : 1/2000				
Proposed Drainage System Plan View				FILE NAME FLS-PDS-PV-102.dwg				
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION				
L0305S	FLS	PDS	PV-102	0				

PLAN VIEW
SCALE 1:500



SECTION A-A'
SCALE 1:250



SECTION B-B'
SCALE 1:250

LEGEND

- CONTOUR LINE EVERY 5M.
- CONTOUR LINE EVERY 1M.
- NATURAL GROUND LEVEL
- FINISHED LEVEL
- Excavation Limit
- Selected Fill

- Surface preparation of the upstream face of the dam: Concrete treatment to smooth the surface and eliminate any sharp protruding blocs penetrating the protection by almost 0.80m.
- Surface preparation on the left side abutment: Compacted embankment made of a continuous gradation, non-plastic, material watered and compacted in layers of less than 50cm thickness.
- Surface preparation of the walls of the reservoir: Smoothing either by removing protruding zones or by concreting or backfilling using non-plastic continuous gradation compacted material.
- Surface preparation of the floor of the reservoir: Smoothing by motor grader work after removing all blocs setting on the surface.
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- Membrane Complex: To be proposed by the Contractor. Made of multiple layers providing watertightness and resistance to punching.
- Physical Protection of the membrane on the slopes: To be proposed by the Contractor. Against Vandalism and UV.
- Physical Protection of the membrane at the bottom of the reservoir: 50cm fill protection.

No	DATE	R E V I S I O N S			ARCH	CIVIL	MECH ELEC

REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT
AND RECONSTRUCTION

BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL
WATER DIVERSION

DAR AL HANDASAH NAZH TALES & PARTNERS
دار الهندسة نزيه طالب وشركاه

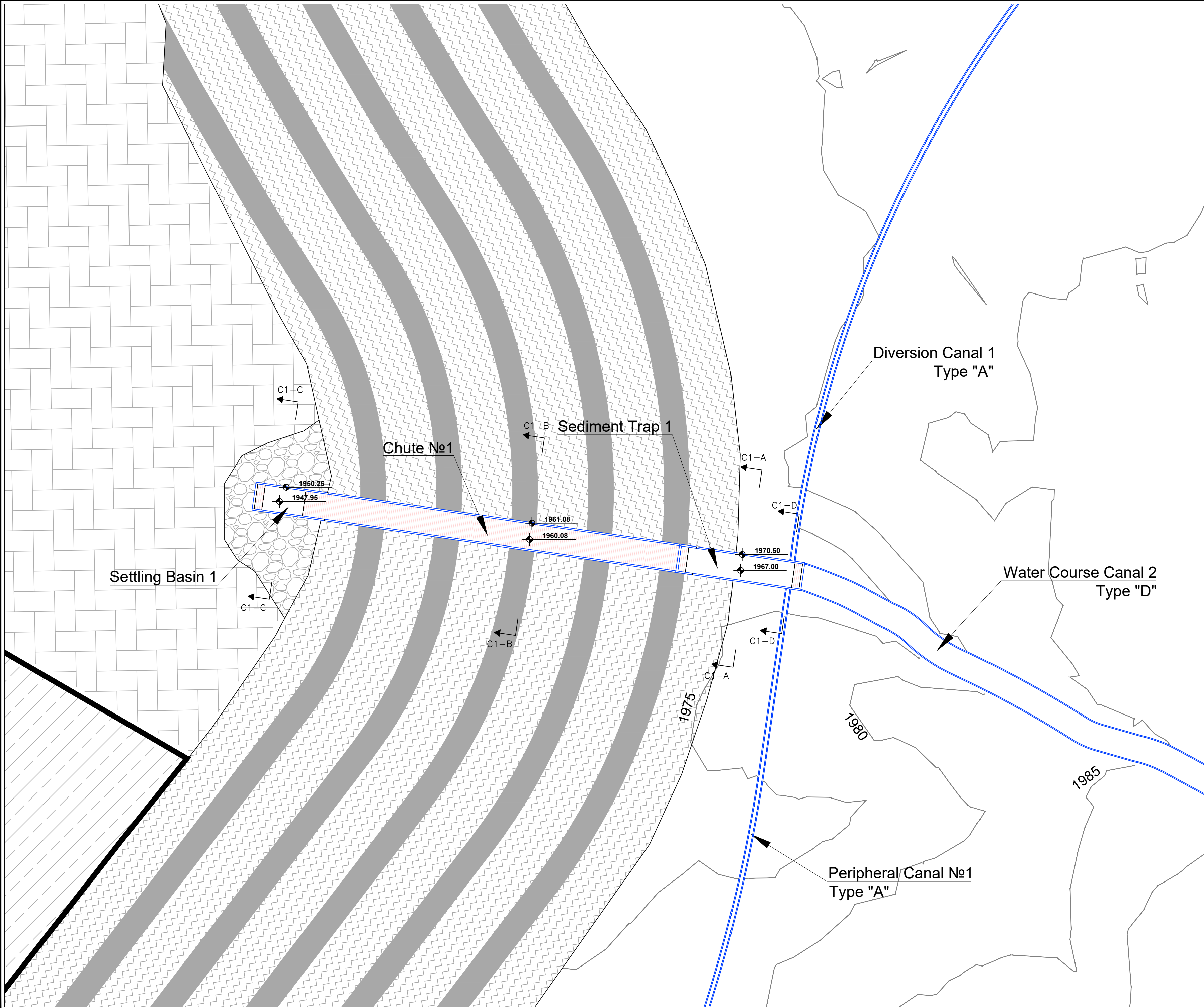
DAM & RESERVOIR
FULL LINING SYSTEM

Stabilization Works on
Left Abutment
Plan View and Sections

PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION
L0305S	FLS	LA	PV-103	0


DRAWN :	---
CHECKED :	---
APPROVED :	---
DATE :	Jan 2024
SCALE :	1/500 - 1/250
FILE NAME	FLS-LA-PV-103.dwg

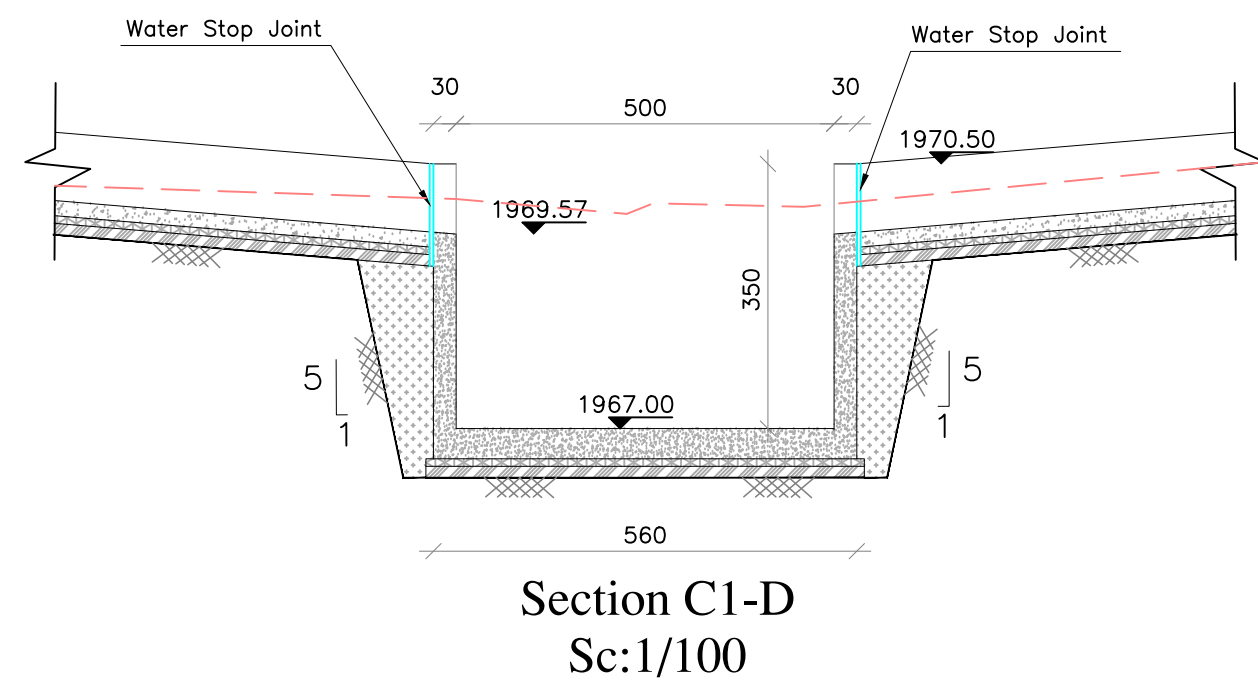
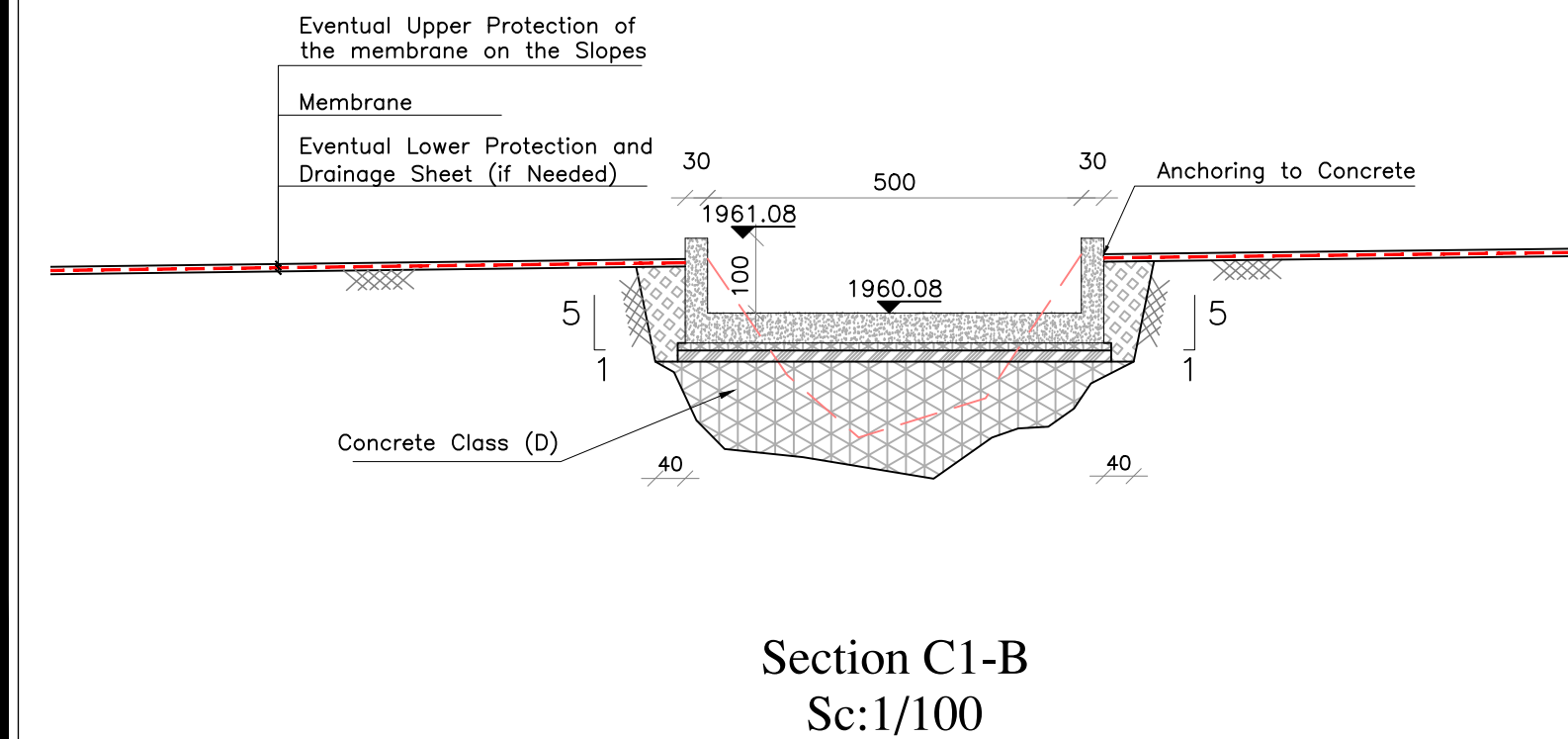
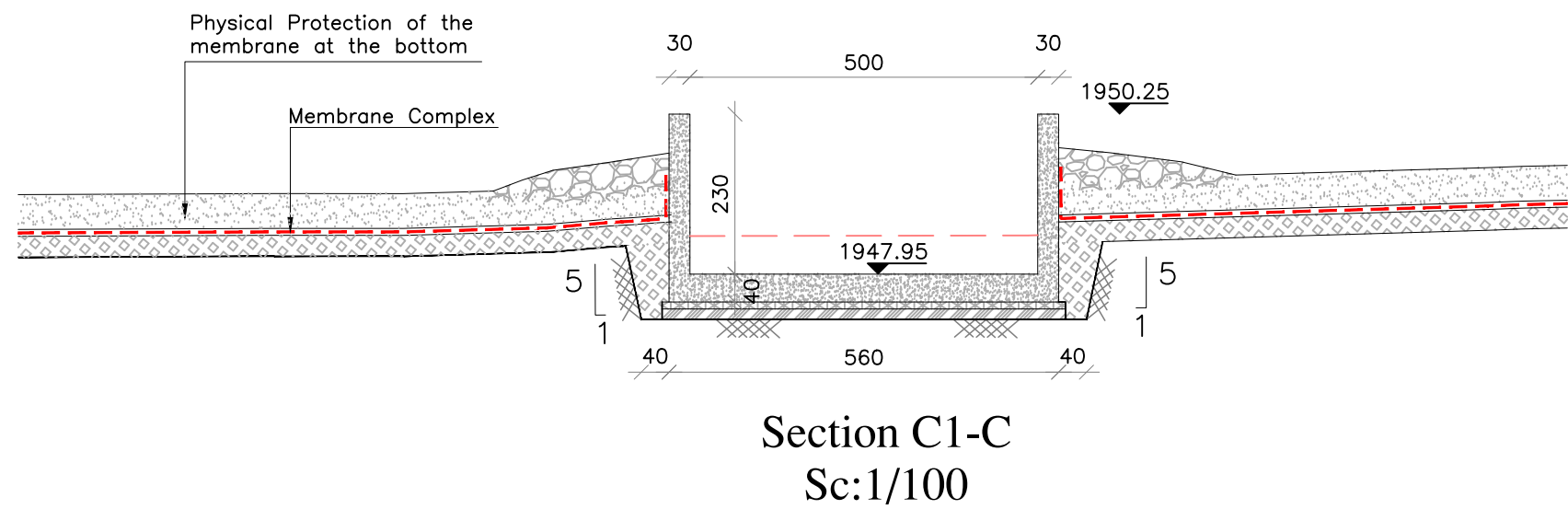
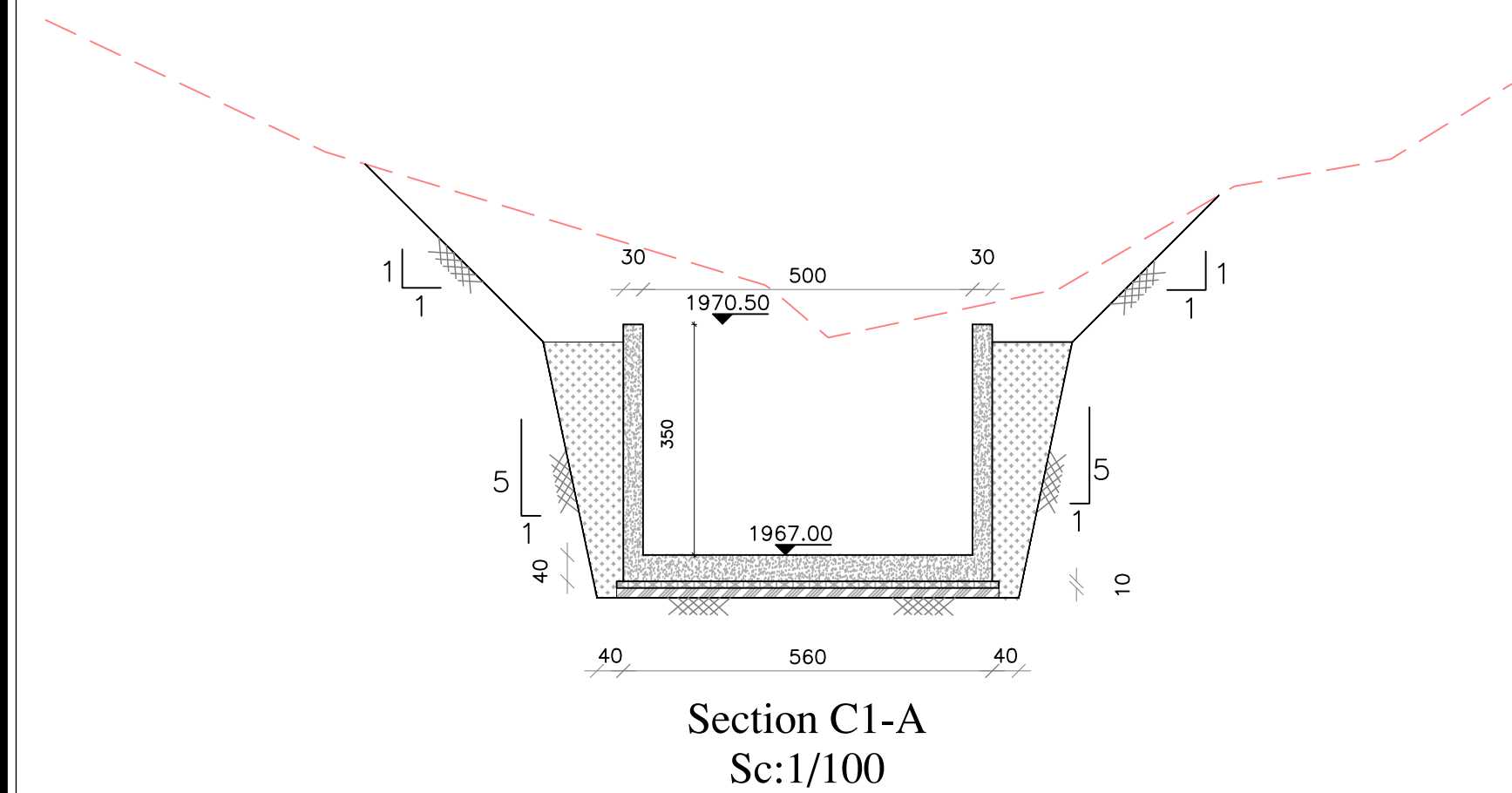
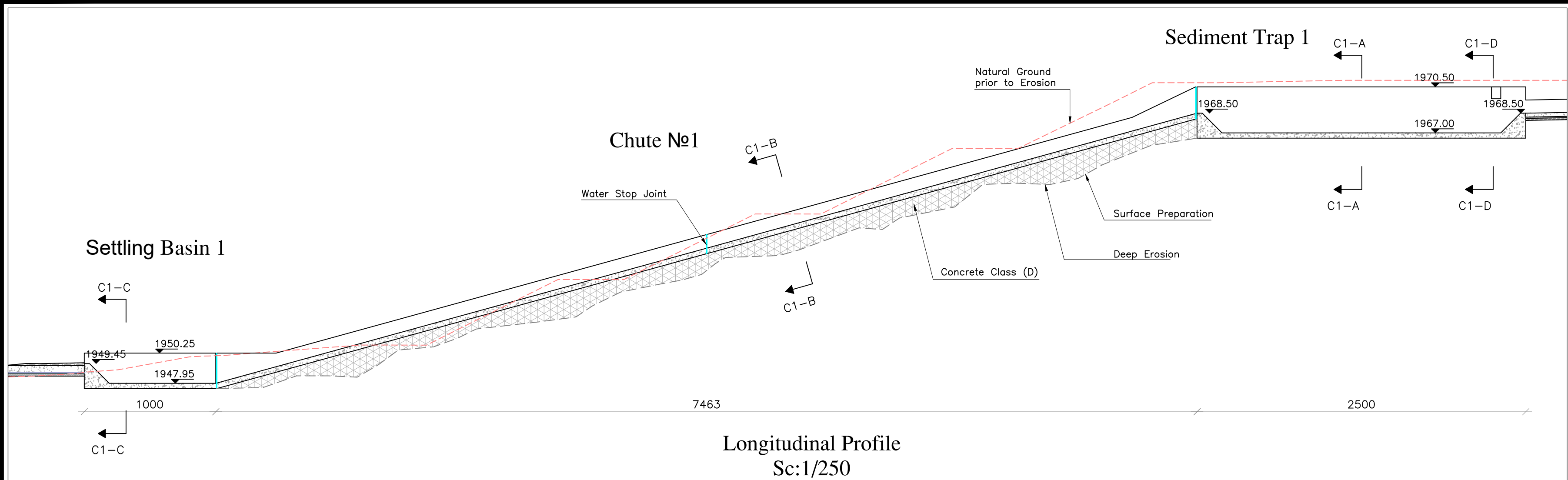
INFLOW CONTROL SYSTEM



LEGEND

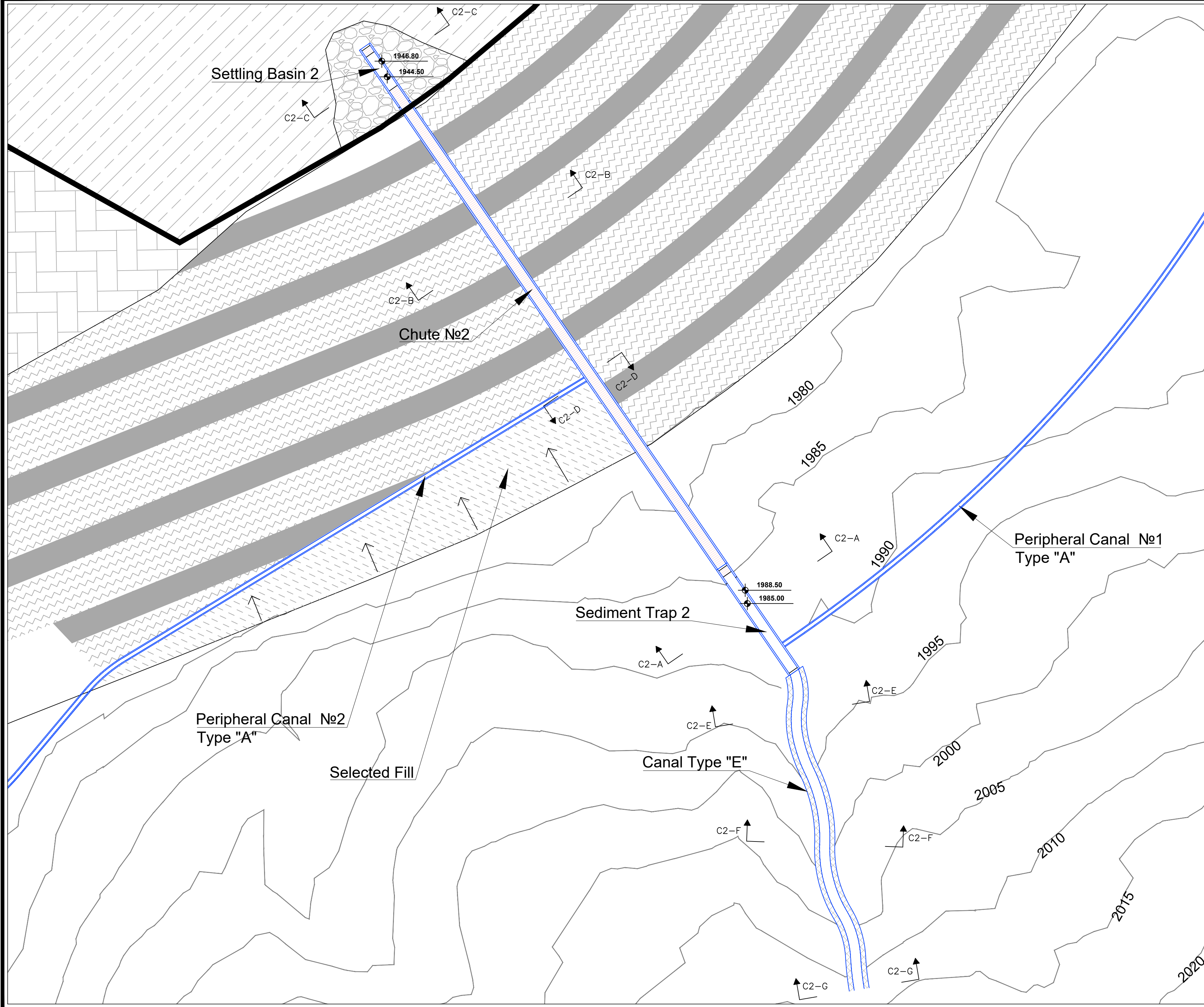
- CONTOUR LINE EVERY 5M.
- PROPOSED CANAL
- 1980.00 FINISHED LEVEL
- RIP RAP

No	DATE	R E V I S I O N S			ARCH	CIVIL	MECH ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION							
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION							
<div><div><div>Founded 1990</div></div><div>DAR AL HANDASAH NAZH TALES & PARTNERS دار الهندسة نزيه طالب وشركاه</div></div>							
DAM & RESERVOIR FULL LINING SYSTEM					DRAWN : ---		
					CHECKED : ---		
					APPROVED : ---		
					DATE : Jan 2024		
Inflow Control System Chute No.1 Plan View					SCALE : 1/500		
					FILE NAME FLS-CS-C1-PV-101.dwg		
PROJECT	DIVISION	SUB-DIVISION			SHEET	REVISION	
L0305S	FLS	CS-C1			PV-101	0	



- LEGEND**
- Natural Ground Level
 - Reinforced Concrete
 - 10 Cm Blinding Concrete
 - Fill or Backfill
 - 15 cm thick Compacted Base Course
 - Box gabions
 - Gabion mattress 30cm thick
 - Medium size riprap
 - Compacted draining fill
 - Rip Rap
 - Drainage and Transition Layer
 - Excavation Limit
 - Nonwoven geotextile sheet

No	DATE	REVISIONS	ARCH	CIVIL	MECH	ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION						
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION						
DAR AL HANDASAH NAZIH TALES & PARTNERS دار الهندسة نزيه طالب وشركاه Founded 1990						
DAM & RESERVOIR FULL LINING SYSTEM			DRAWN : CHECKED : APPROVED : DATE : Jan 2024 SCALE : 1/250, 1/100			
Inflow Control System Chute No.1 Sections			FILE NAME FLS-CS-C1-S-201.dwg			
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION		
L0305S	FLS	CS-C1	S-200	0		



LEGEND

- CONTOUR LINE EVERY 5M.
- PROPOSED CANAL
- FINISHED LEVEL
- RIP RAP
- SELECTED FILL

No	DATE	R E V I S I O N S			ARCH	CIVIL	MECH ELEC

REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT
AND RECONSTRUCTION

BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL
WATER DIVERSION

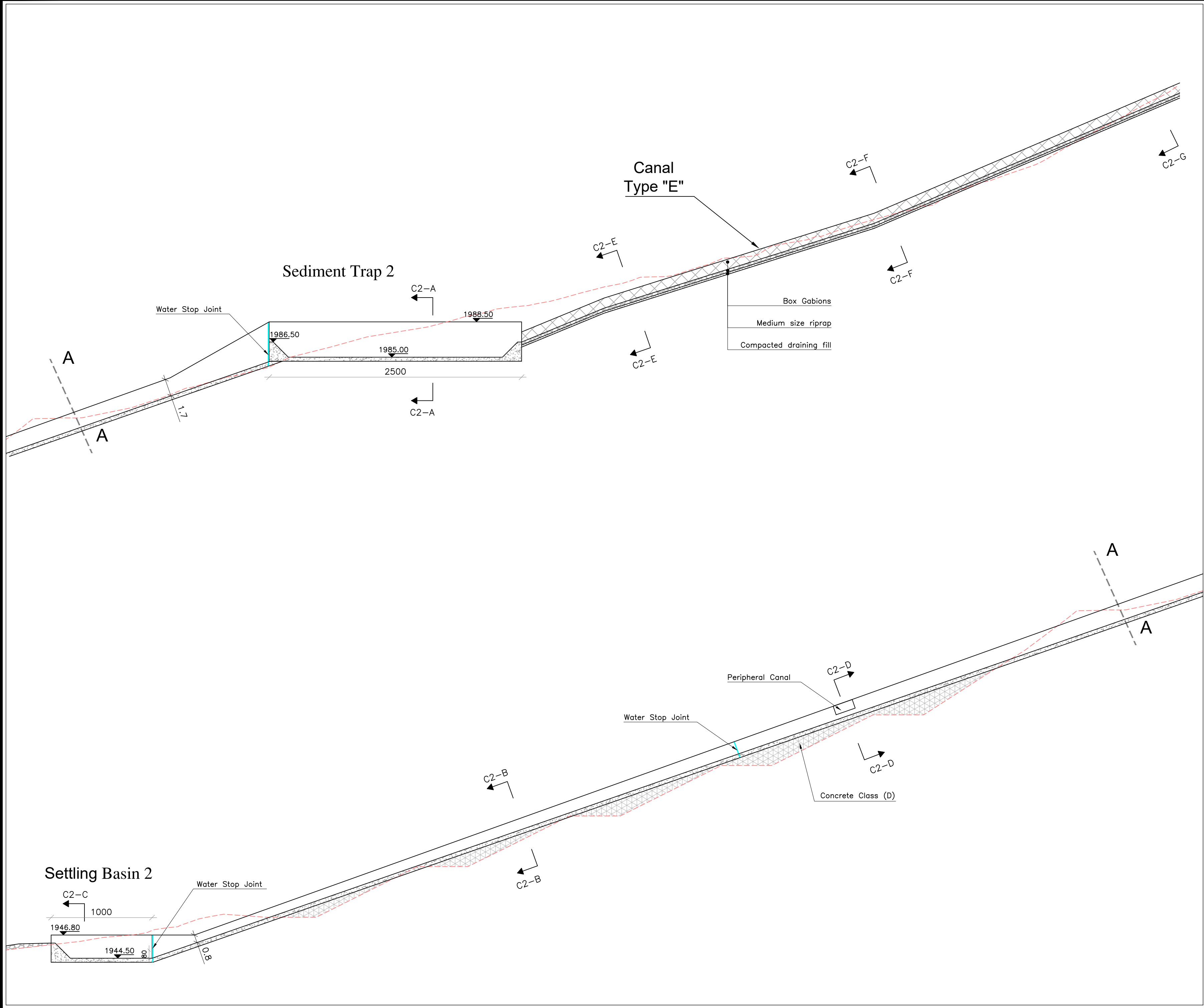
 DAR AL HANDASAH NAZH TALEB & PARTNERS
دار الهندسة نزيه طالب وشركاه

DAM & RESERVOIR
FULL LINING SYSTEM

Inflow Control System
Chute No.2
Plan View


DRAWN :	---
CHECKED :	---
APPROVED :	---
DATE :	Jan 2024
SCALE :	1/500
FILE NAME	
FLS-CS-C2-PV-102.dwg	

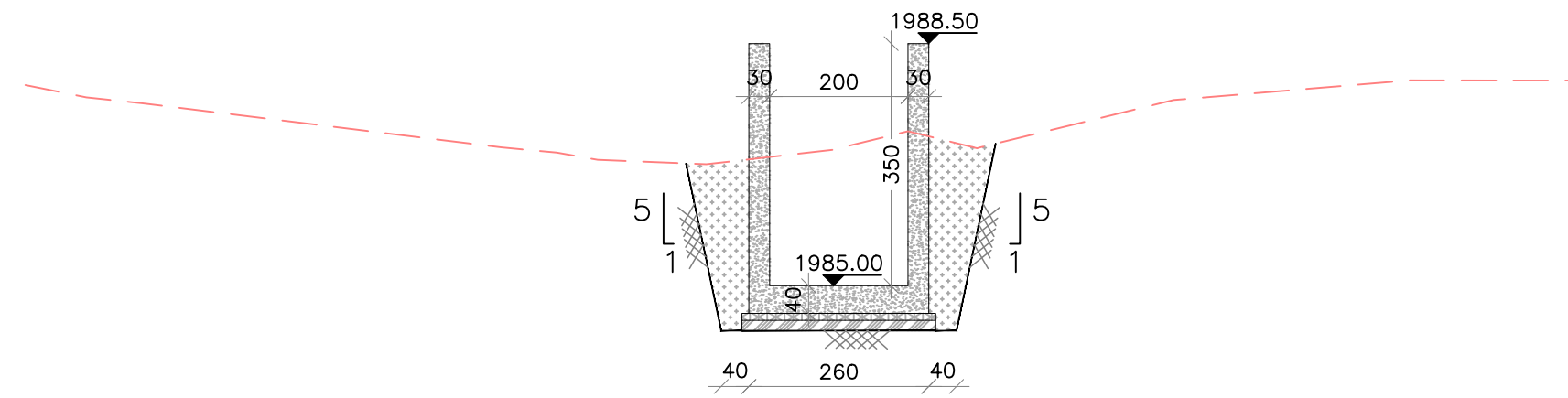
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION
L0305S	FLS	CS-C2	PV-102	0



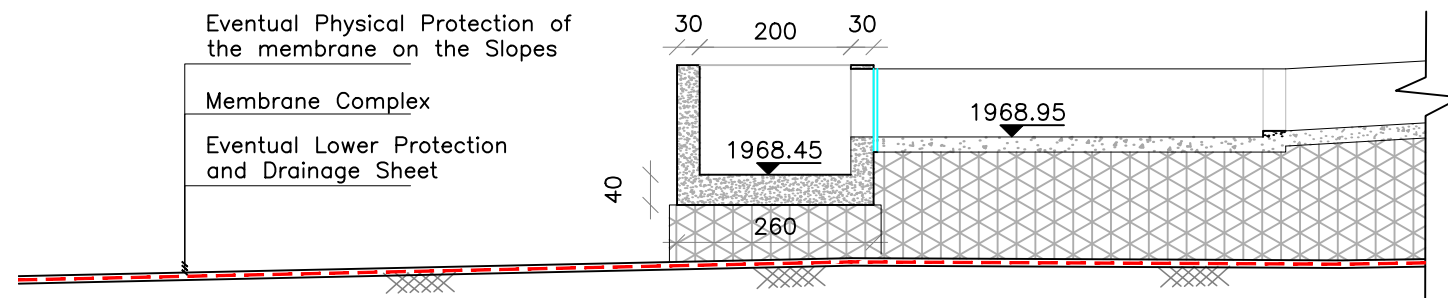
LEGEND

- Natural Ground Level
- Reinforced Concrete
- 10 Cm Blinding Concrete
- Fill or Backfill
- 15 cm thick Compacted Base Course
- Box gabions
- Gabion mattress 30cm thick
- Medium size riprap
- Compacted draining fill
- Rip Rap
- Drainage and Transition Layer
- Excavation Limit
- Nonwoven geotextile sheet

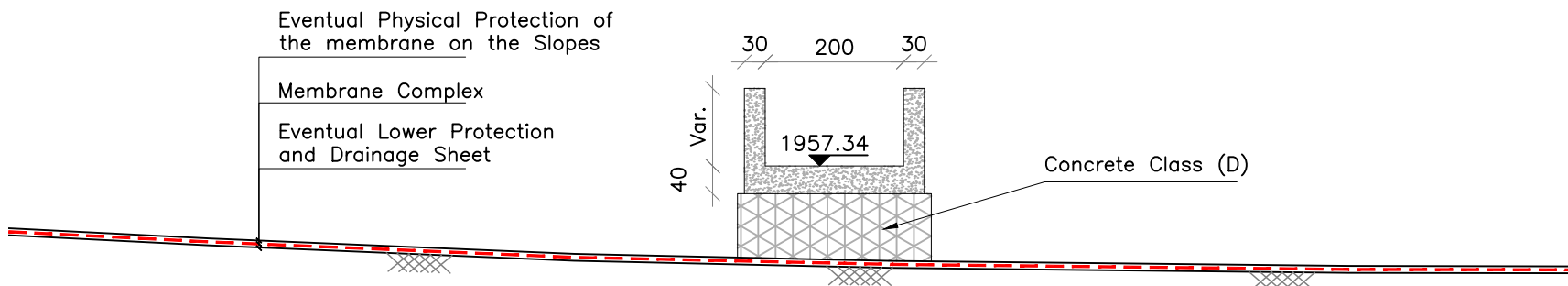
No	DATE	R E V I S I O N S			ARCH	CIVIL	MECH ELEC
<div>REPUBLIC OF LEBANON</div> <div>COUNCIL FOR DEVELOPMENT</div> <div>AND RECONSTRUCTION</div>							
<div>BRISSA DAM & RESERVOIR</div> <div>FULL LINING AND ADDITIONAL</div> <div>WATER DIVERSION</div>							
<div><div></div><div><div>DAR AL HANDASAH NAZIH TALES & PARTNERS</div><div>دار الهندسة نزيه طالب وشركاه</div></div></div>							
<div>DAM & RESERVOIR</div> <div>FULL LINING SYSTEM</div>					<div>DRAWN : _____</div> <div>CHECKED : _____</div> <div>APPROVED : _____</div> <div>DATE : _____ Jan 2024</div> <div>SCALE : _____ 1/250</div>		
<div>Inflow Control System</div> <div>Chute No.2</div> <div>Longitudinal Profile</div>					<div>FILE NAME</div> <div>FLS-CS-C1-S-202.dwg</div>		
PROJECT	DIVISION	SUB-DIVISION			SHEET	REVISION	
L0305S	FLS	CS-C1			S-202	0	



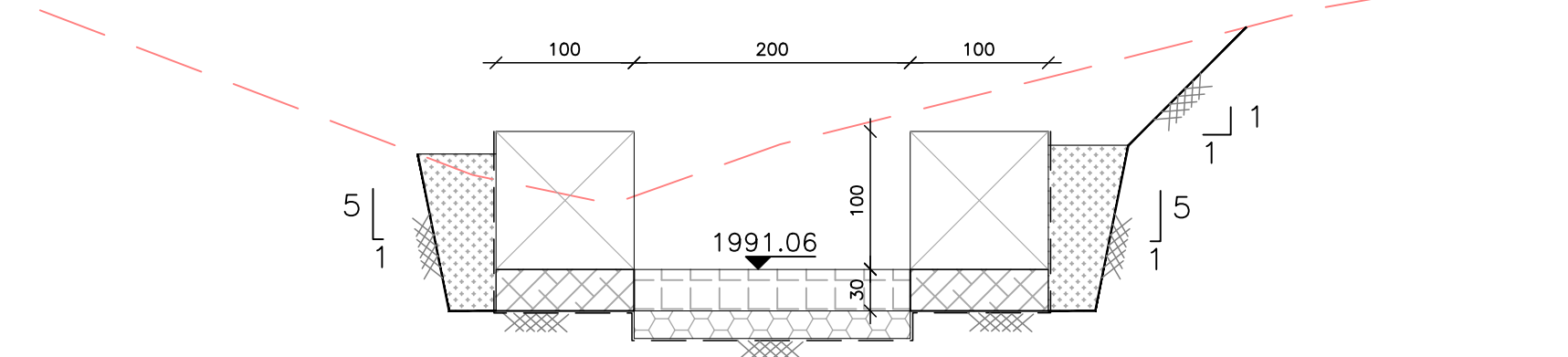
Section C2-A
Sc:1/100



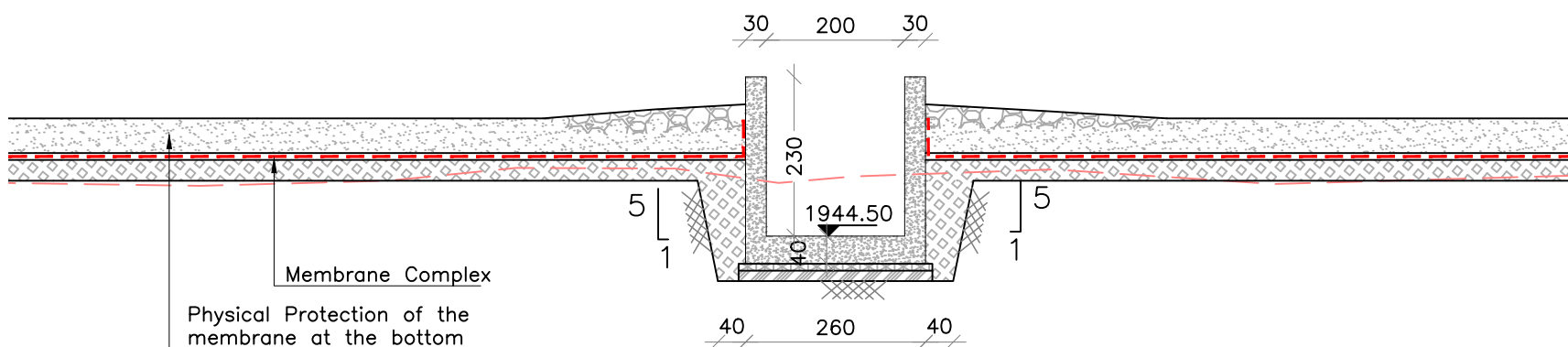
Section C2-D
Sc:1/100



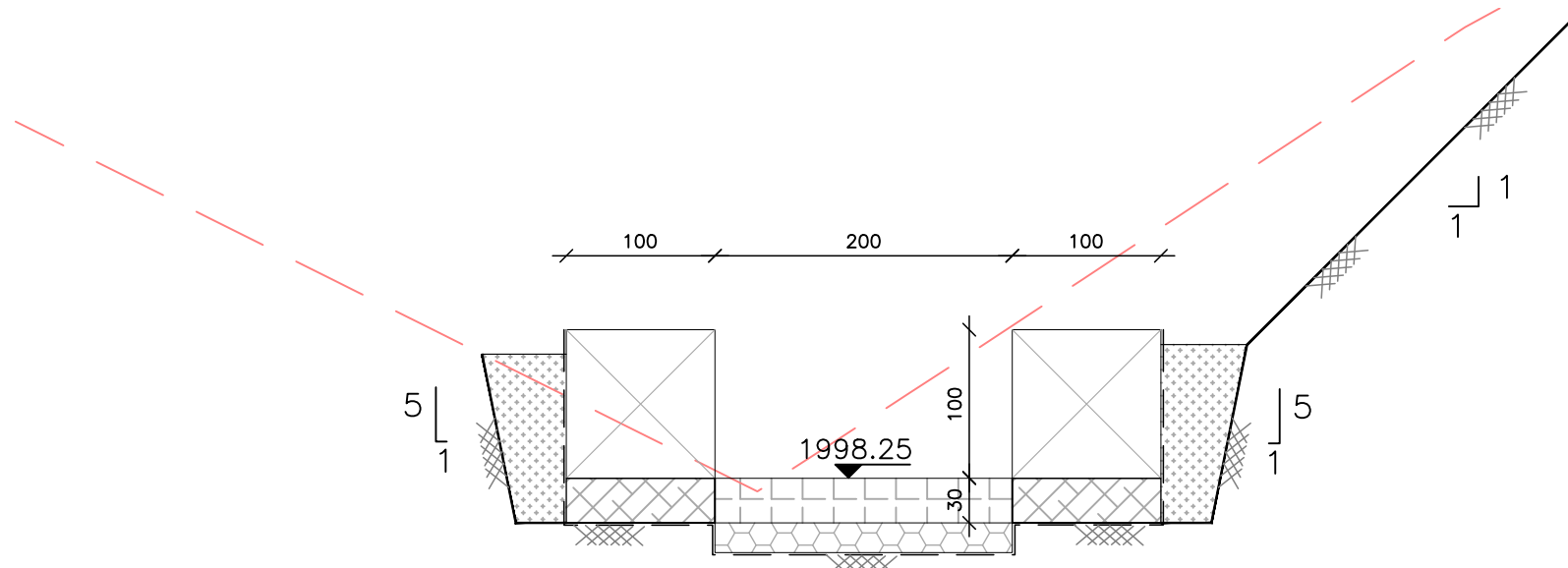
Section C2-B
Sc:1/100



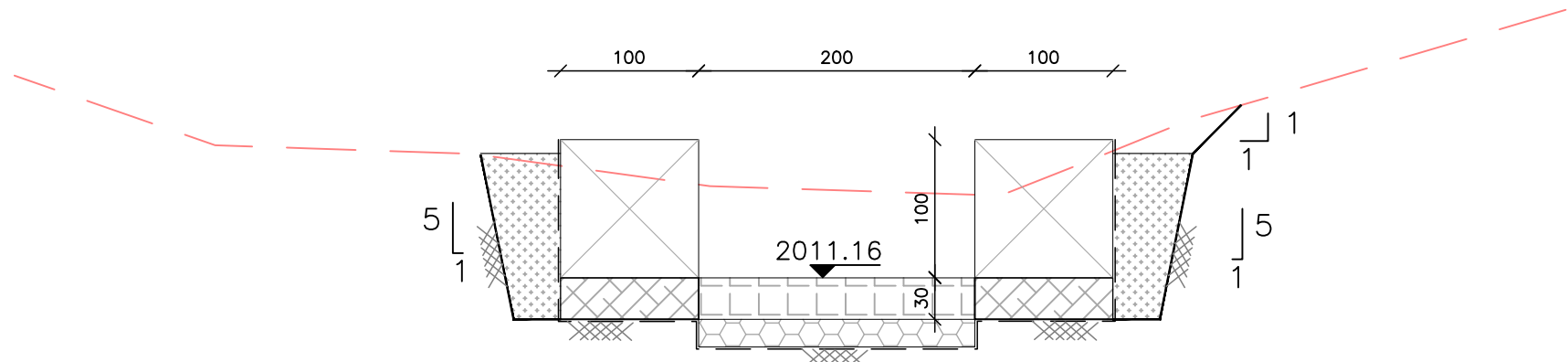
Section C2-E
Sc:1/50



Section C2-C
Sc:1/100



Section C2-F
Sc:1/50

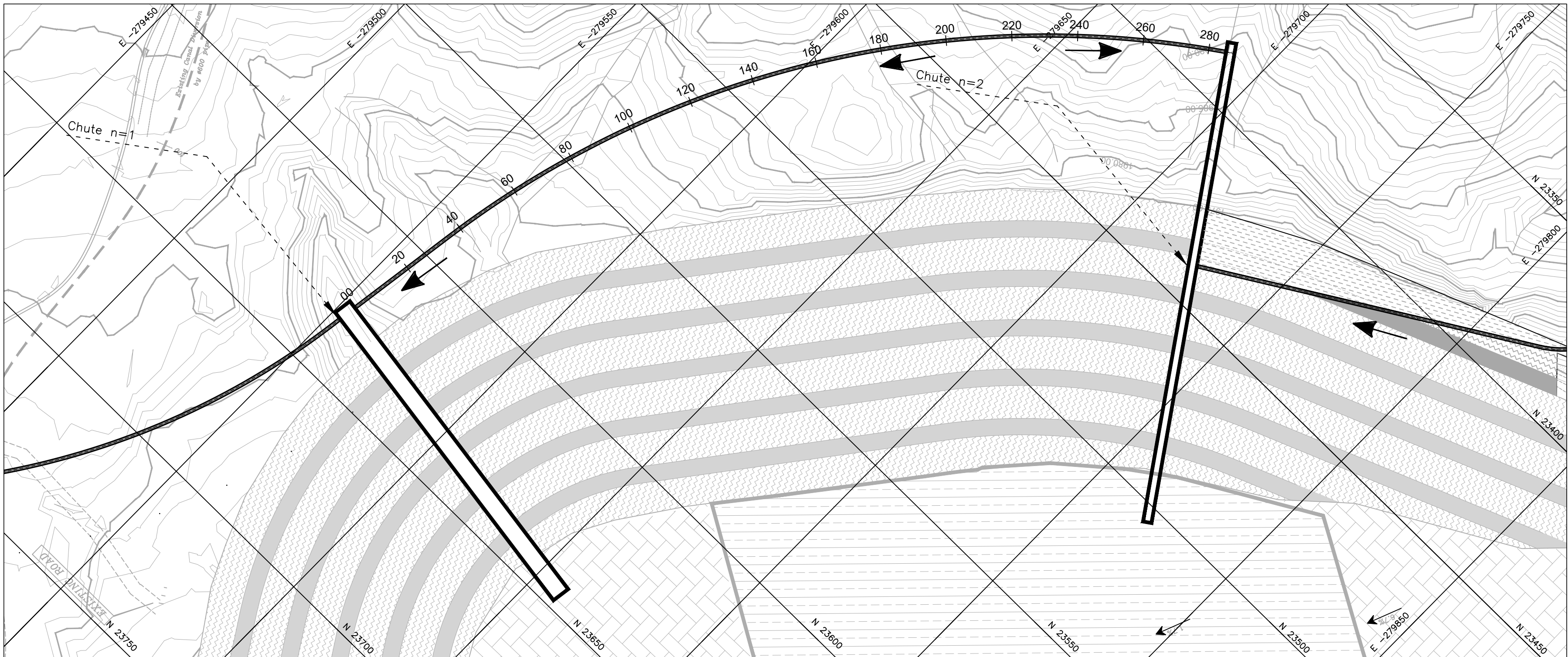


Section C2-G
Sc:1/50

LEGEND

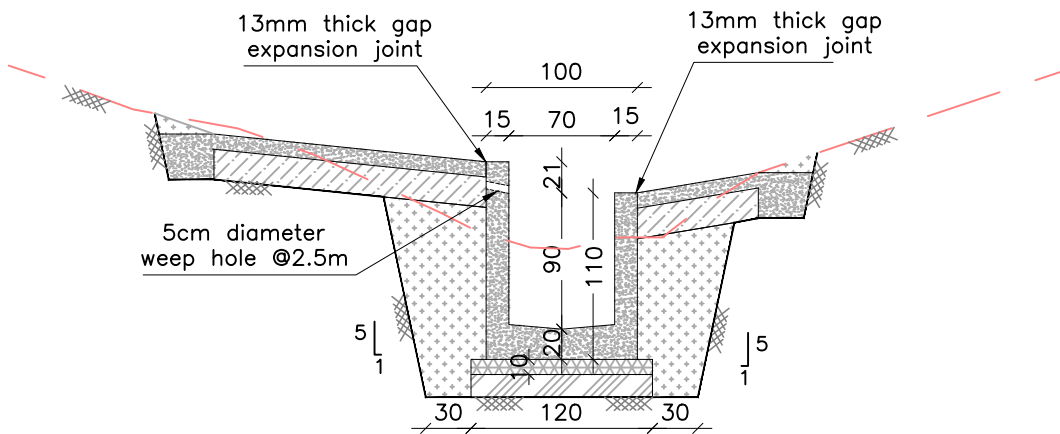
- Natural Ground Level
- Reinforced Concrete
- 10 Cm Blinding Concrete
- Fill or Backfill
- 15 cm thick Compacted Base Course
- Box gabions
- Gabion mattress 30cm thick
- Medium size riprap
- Compacted draining fill
- Rip Rap
- Drainage and Transition Layer
- Excavation Limit
- Nonwoven geotextile sheet

No	DATE	REVISIONS	ARCH	CIVIL	MECH	ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION						
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION						
DAR AL HANDASAH NAZIH TALES & PARTNERS دار الهندسة نزيه طالب وشركاه						
DAM & RESERVOIR FULL LINING SYSTEM			DRAWN : CHECKED : APPROVED : DATE : Jan 2024			
Inflow Control System Chute No.2 Sections			SCALE : 1/100 - 1/50 FILE NAME FLS-CS-C1-S-203.dwg			
PROJECT L0305S	DIVISION FLS	SUB-DIVISION CS-C1	SHEET S-203	REVISION 0		




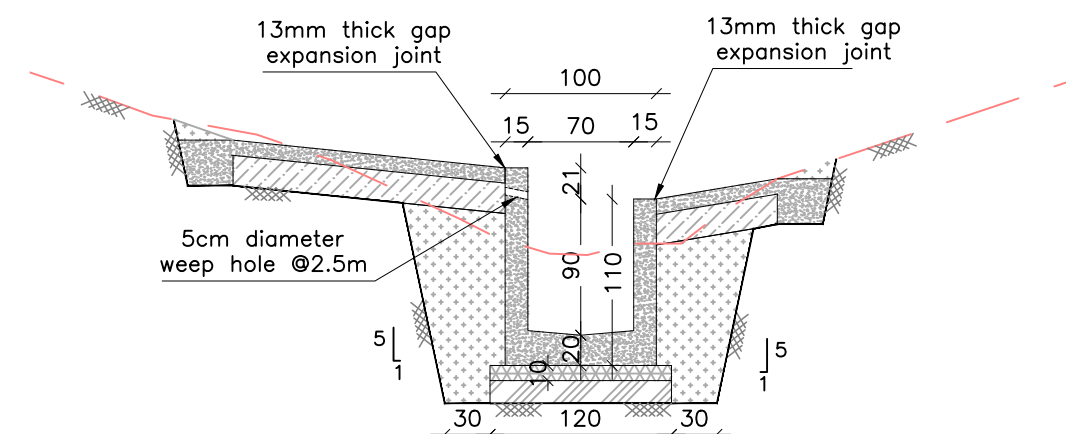
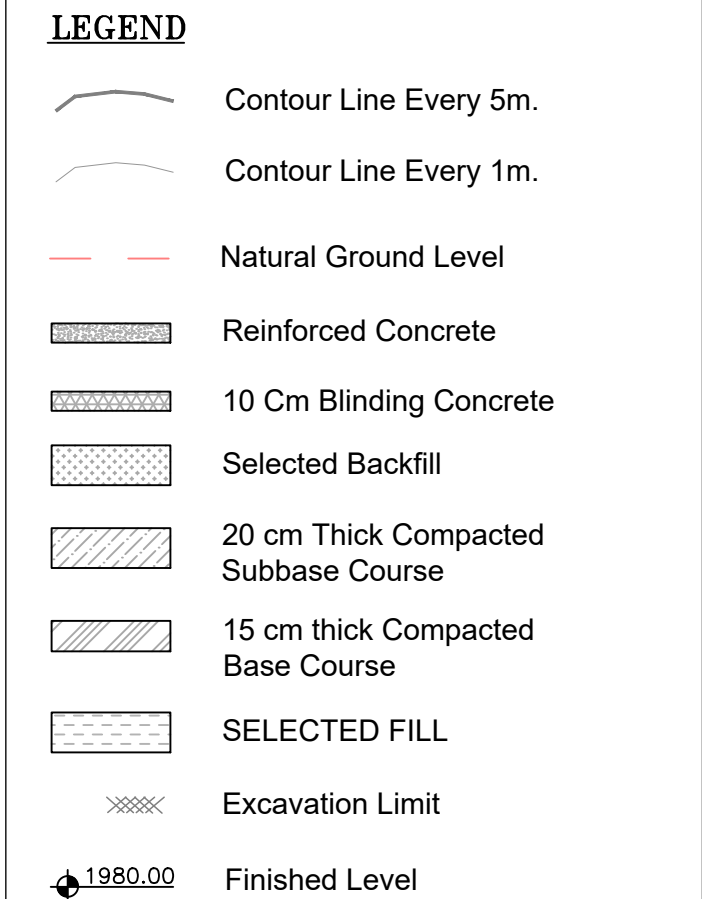
- LEGEND**
- Contour Line Every 5m.
 - Contour Line Every 1m.
 - Natural Ground Level
 - Reinforced Concrete
 - 10 Cm Blinding Concrete
 - Selected Backfill
 - 20 cm Thick Compacted Subbase Course
 - 15 cm thick Compacted Base Course
 - Excavation Limit
 - 1980.00 Finished Level

REFERENCE LEVEL	+1945														
PEG	00	20	40	60	80	100	120	140	160	180	200	220	240	260	280
NATURAL GROUND LEVEL	-1972.10	-1977.25	-1974.49	-1975.88	-1977.16	-1979.78	-1984.07	-1987.05	-1987.97	-1987.38	-1988.79	-1989.13	-1993.07	-1990.13	-1989.98
PROJECT LEVEL	-1969.57	-1971.94	-1974.31	-1976.68	-1979.05	-1981.42	-1983.79	-1985.82	-1986.23	-1986.65	-1987.06	-1988.28	-1991.30	-1989.30	-1985.90
STRUCTURE TYPE & LENGTH	CHANNEL TYPE A L=~285M														
SLOPE %	11.85 %					2.06 %					15.08 %			16.96 %	



Channel Type " A "
Sc:1/50

No	DATE	REVISIONS	ARCH	CIVIL	MECH	ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION						
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION						
 DAR AL HANDASAH NAZIH TALEB & PARTNERS دار الهندسة نزيه طالب وشركاه						
DAM & RESERVOIR FULL LINING SYSTEM			DRAWN : --- CHECKED : --- APPROVED : --- DATE : Jan 2024 SCALE : 1/1000 - 1/50 FILE NAME FLS-CS-P1-101.dwg			
Inflow Control System Peripheral Channel 1 Plan View, Profile and Section			PROJECT L0305S			
DIVISION FLS			SUB-DIVISION CS-P1		SHEET 101	
					REVISION 0	



Channel Type " A "
Sc:1/50

No	DATE	REVISIONS	ARCH	CIVIL	MECH	ELEC

REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT
AND RECONSTRUCTION

**BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL
WATER DIVERSION**



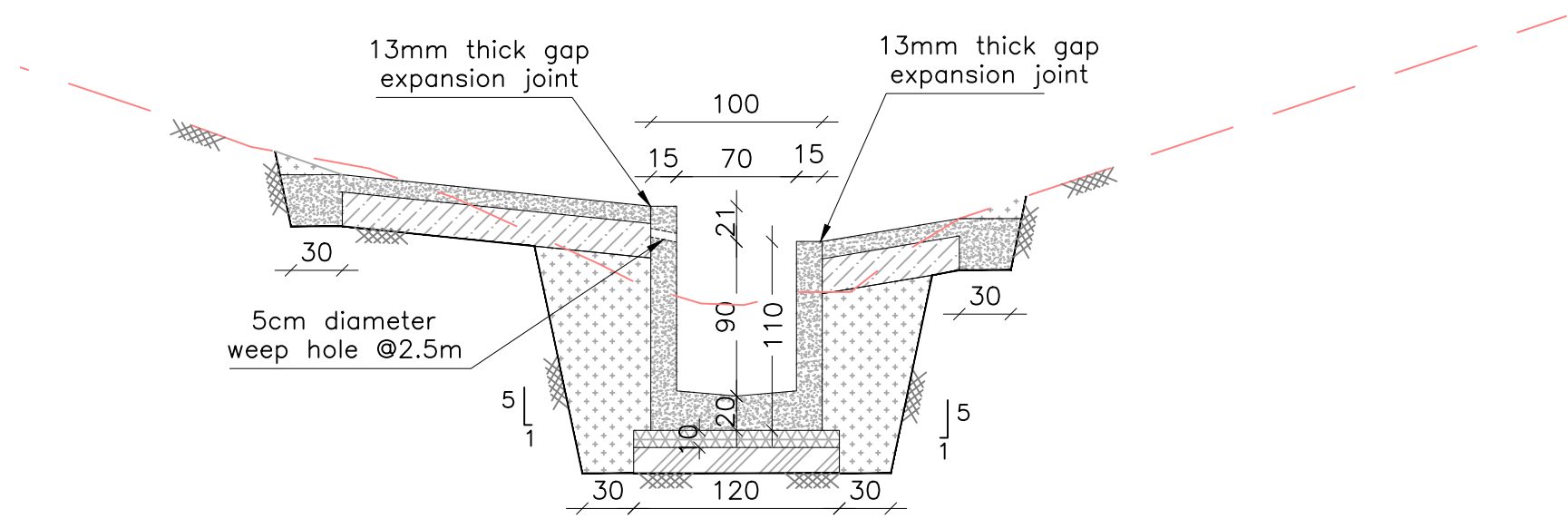
DAR AL HANDASAH NAZIH TALEB & PARTNERS
دار الهندسة نزيه طالب وشركاه

DAM & RESERVOIR FULL LINING SYSTEM

**Inflow Control System
Peripheral Channel 2
Plan View, Profile and Section**

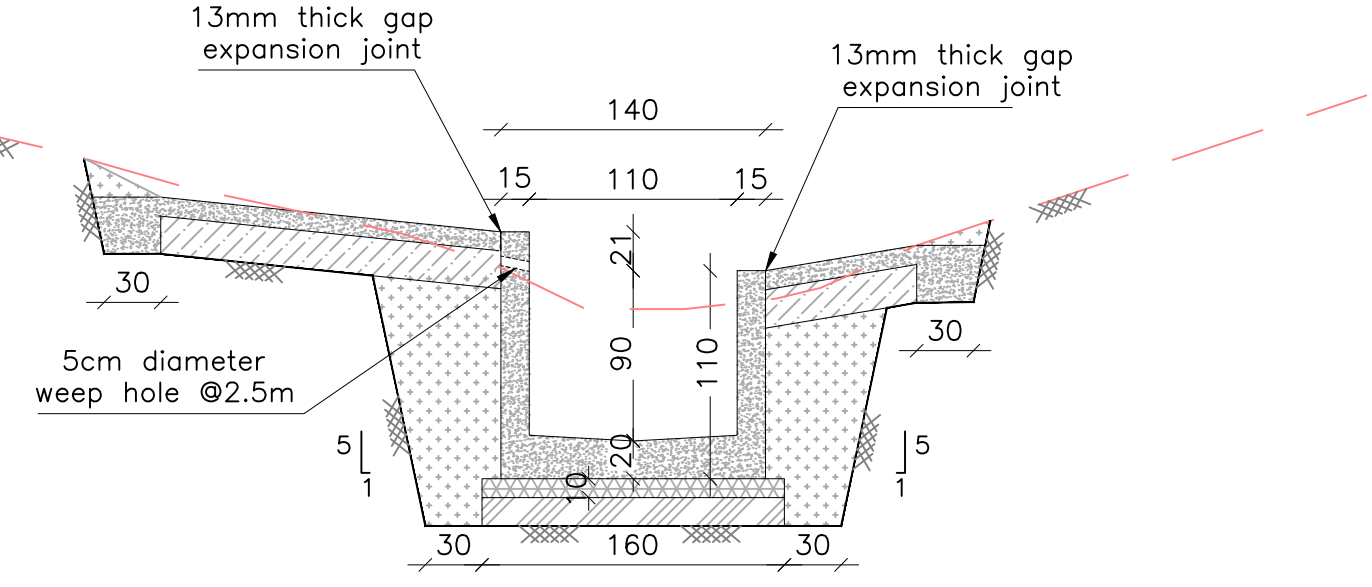
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION
L0305S	FLS	CS-P1	102	0

DRAWN :	---
CHECKED :	---
APPROVED :	---
DATE :	Jan 2024
SCALE :	1/1000 - 1/50



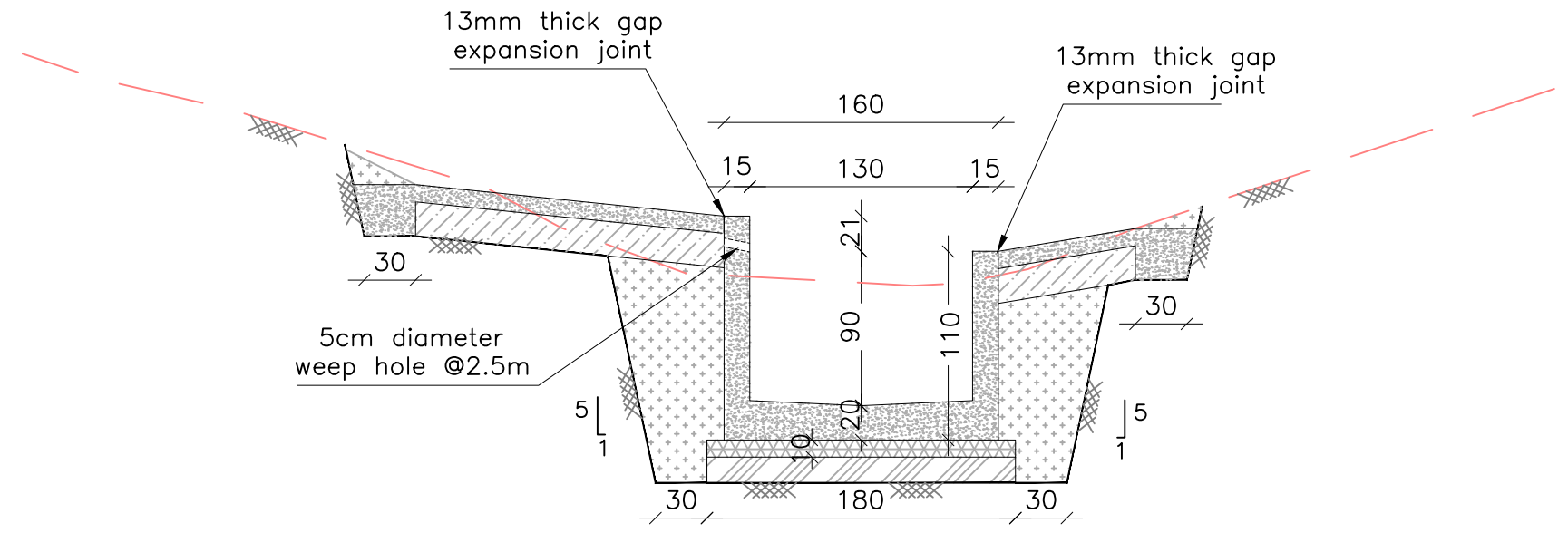
Channel Type " A "

Sc:1/50



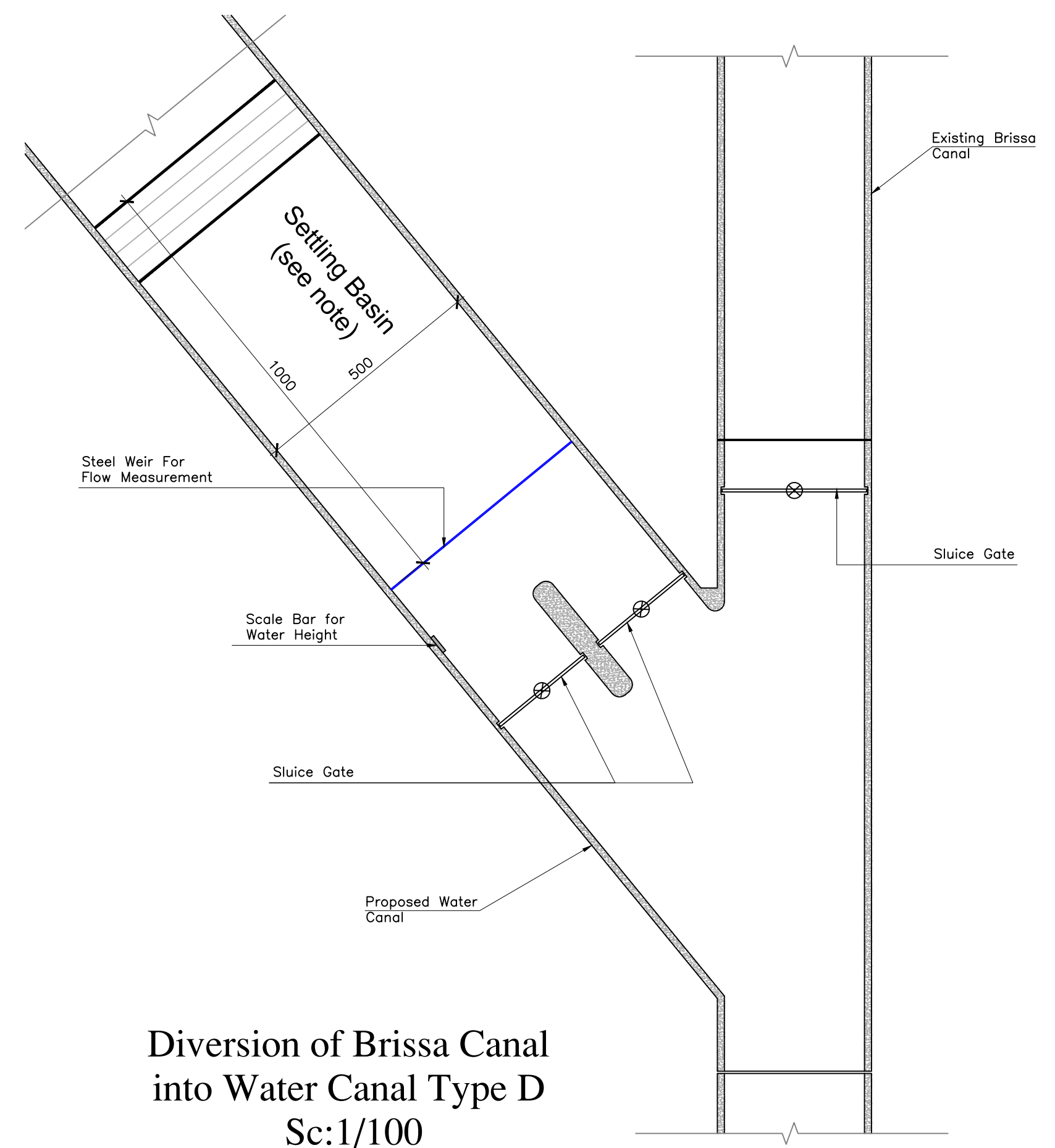
Channel Type " B "

Sc:1/50



Channel Type " C "

Sc:1/50



Diversion of Brissa Canal
into Water Canal Type D

Sc:1/100

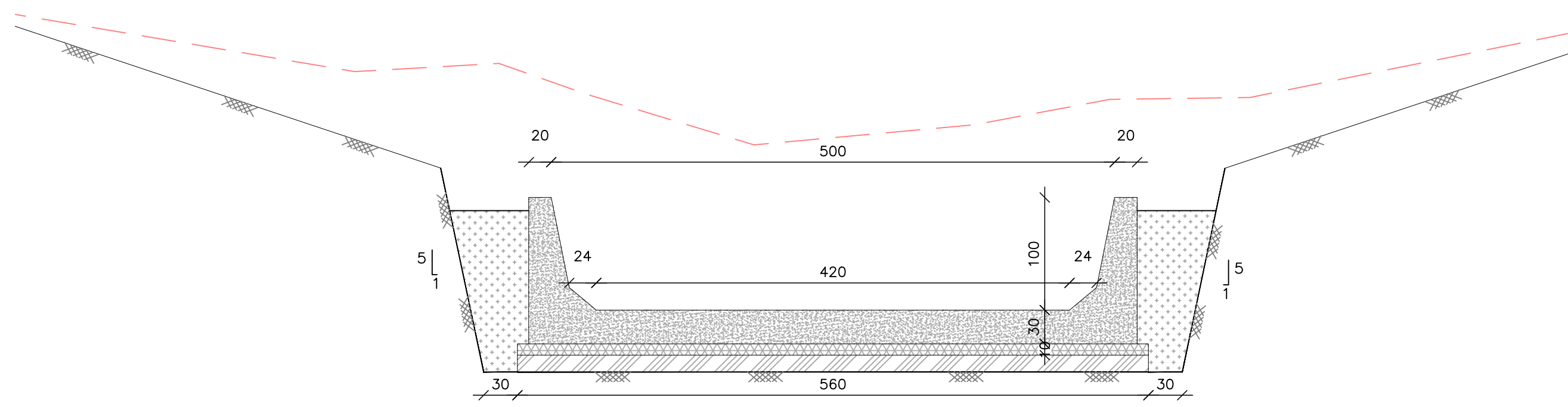
LEGEND

- Natural Ground Level
- Reinforced Concrete
- 10 Cm Blinding Concrete
- Selected Backfill
- 20 cm Thick Compacted Subbase Course
- 15 cm thick Compacted Base Course
- Box gabions
- Gabion mattress 30cm thick
- Medium size riprap
- Compacted draining fill
- Excavation Limit
- Nonwoven geotextile sheet

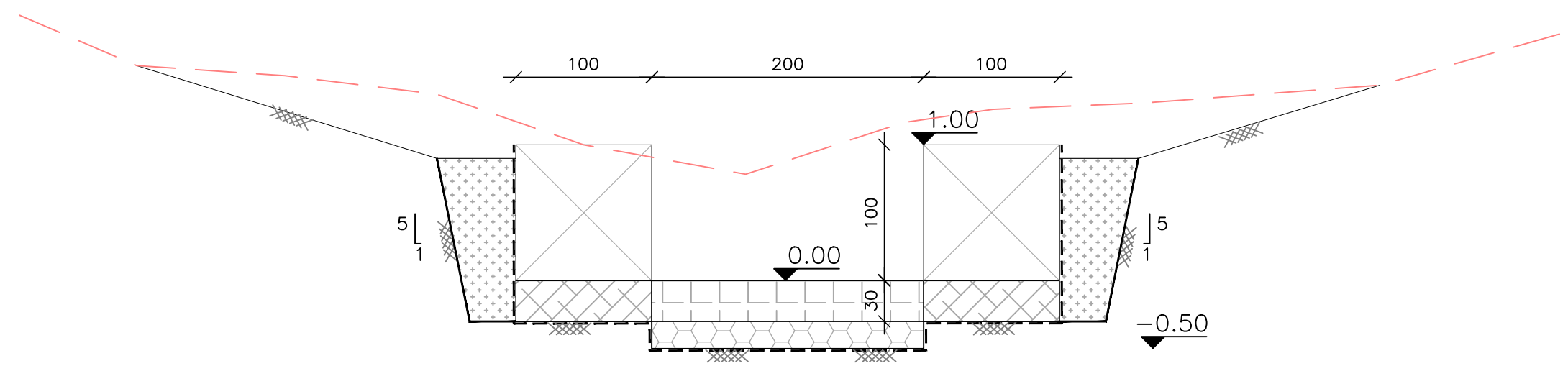
NOTE

- Settling Basins Should be Executed Along the Brissa Diversion Canal as Needed and as Approved by the Engineer.

No	DATE	REVISIONS	ARCH	CIVIL	MECH	ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION						
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION						
DAR AL HANDASAH NAZH TALES & PARTNERS دار الهندسة نزيه طالب وشركاه						
DAM & RESERVOIR FULL LINING SYSTEM			DRAWN : CHECKED : APPROVED : DATE : Jan 2024 SCALE : 1/40			
Inflow Control System Typical Details 1/2 Canals Type A,B & C			FILE NAME FLS-CS-TD-201.dwg			
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION		
L0305S	FLS	CS	TD-201	0		



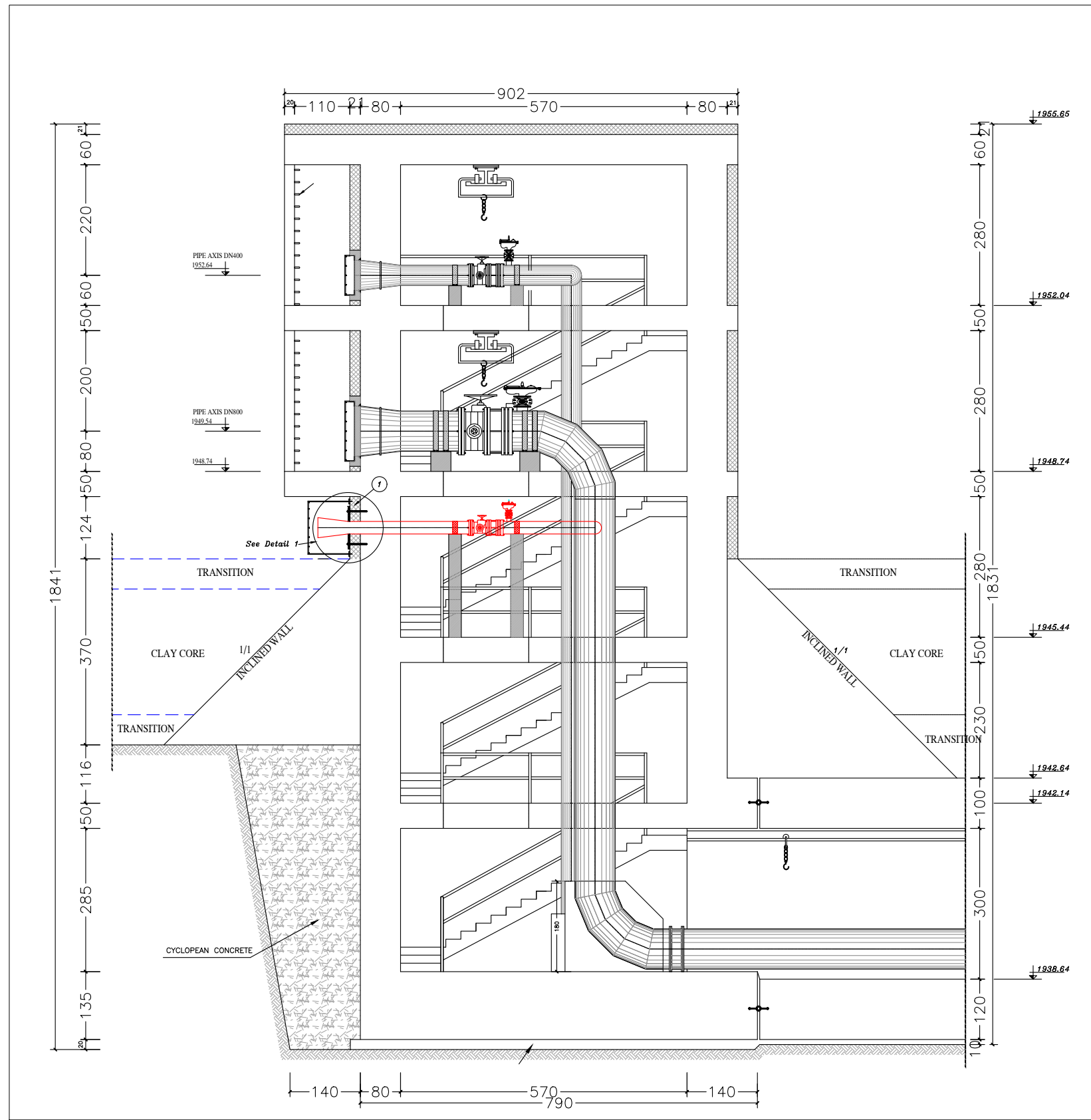
Channel Type " D "
Sc:1/50



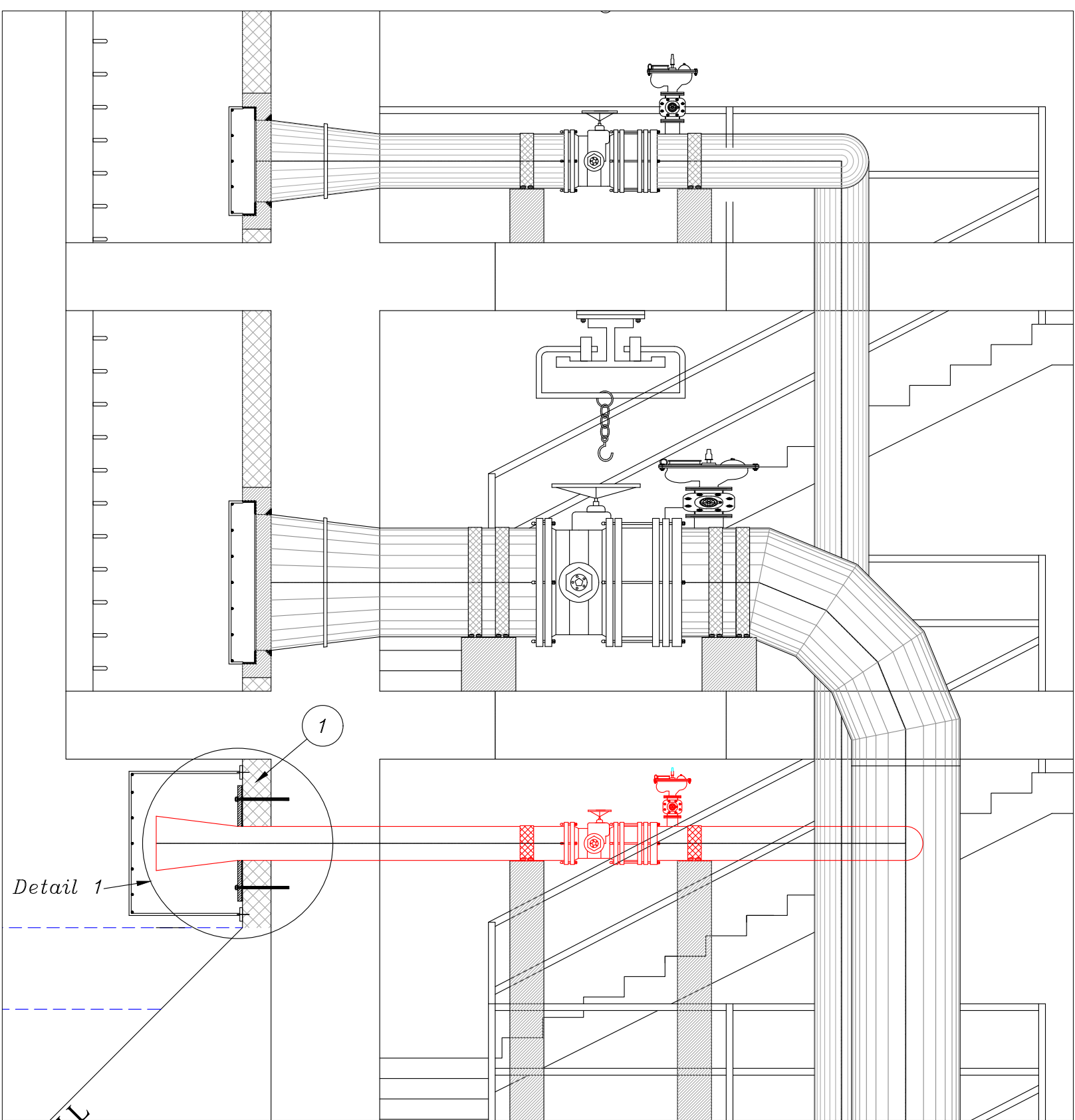
Channel Type " E "
Sc:1/50

- LEGEND**
- Natural Ground Level
 - Reinforced Concrete
 - 10 Cm Blinding Concrete
 - Selected Backfill
 - 20 cm Thick Compacted Subbase Course
 - 15 cm thick Compacted Base Course
 - Box gabions
 - Gabion mattress 30cm thick
 - Medium size riprap
 - Compacted draining fill
 - Excavation Limit
 - Nonwoven geotextile sheet

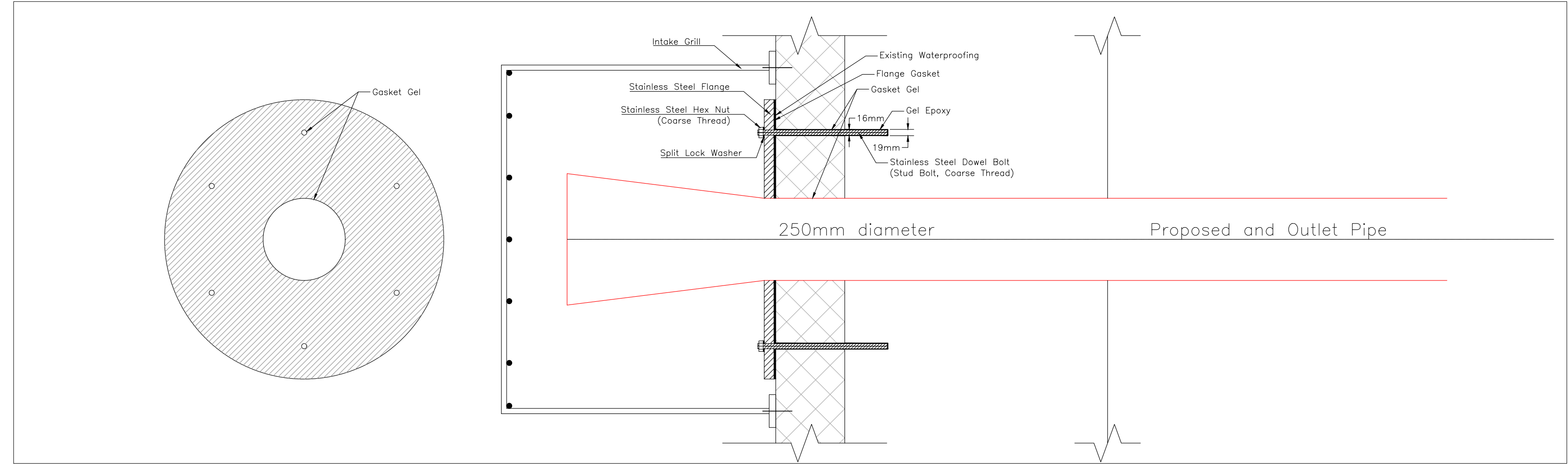
No	DATE	R E V I S I O N S			ARCH	CIVIL	MECH ELEC
<div>REPUBLIC OF LEBANON</div> <div>COUNCIL FOR DEVELOPMENT</div> <div>AND RECONSTRUCTION</div>							
<div>BRISSA DAM & RESERVOIR</div> <div>FULL LINING AND ADDITIONAL</div> <div>WATER DIVERSION</div>							
<div><div><div>Founded 1990</div></div><div>DAR AL HANDASAH NAZIH TALEB & PARTNERS</div><div>دار الهندسة نزيه طالب وشركاه</div></div>							
<div>DAM & RESERVOIR</div> <div>FULL LINING SYSTEM</div>					DRAWN : ---		
					CHECKED : ---		
					APPROVED : ---		
					DATE : Jan 2024		
<div>Inflow Control System</div> <div>Typical Details 2/2</div> <div>Canals Type D & E</div>					SCALE : 1/40		
					FILE NAME FLS-CS-TD-202.dwg		
PROJECT	DIVISION	SUB-DIVISION			SHEET	REVISION	
L0305S	FLS	CS			TD-202	0	



Section E-E



Detail "2"



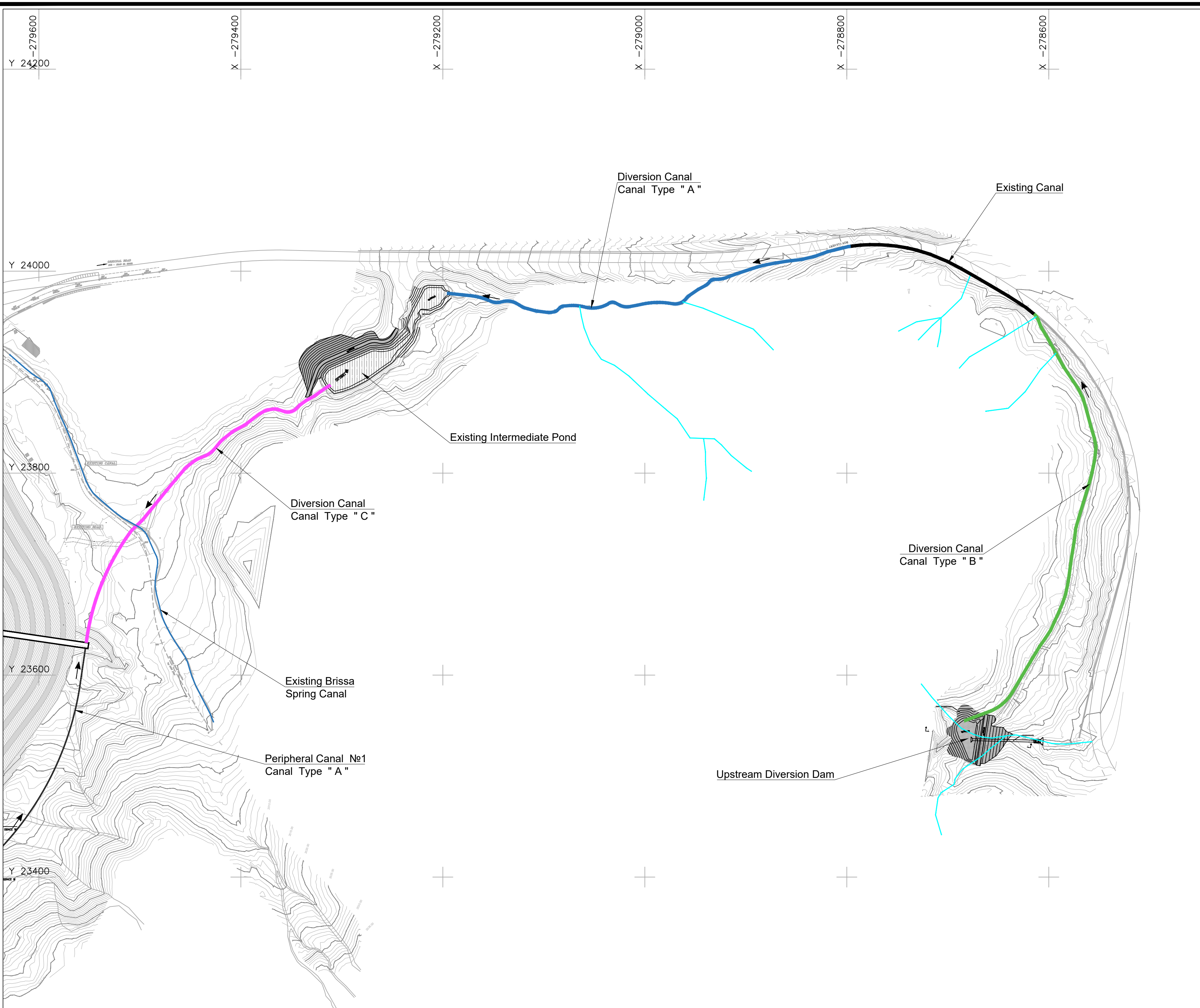
Detail "1"
Proposed Lower Outlet Pipe

LEGEND

1 — PROTECTION BLACK th=20CM

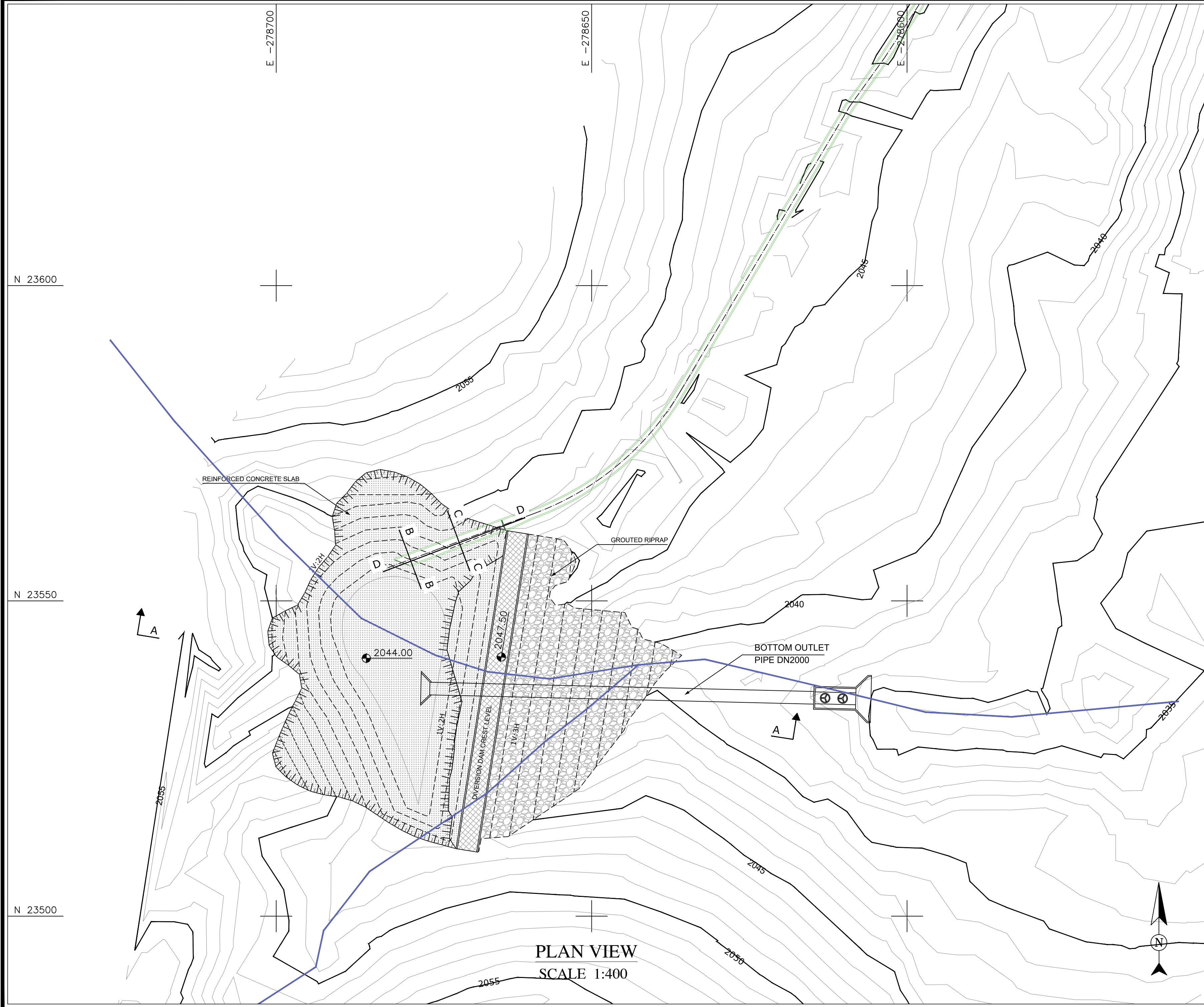
No	DATE	REVISIONS	ARCH	CIVIL	MECH	ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION						
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION						
DAR AL-HANDASAH NAZIH TALES & PARTNERS دار الهندسة نزيه طالب وشركاه						
DAM & LAKE FULL LINING SYSTEM			DRAWN : --- CHECKED : --- APPROVED : --- DATE : Jan 2024 SCALE : NTS			
Additional Intake Welded Steel Pipe Section & Details			FILE NAME FLS-ASP-SD-203.dwg			
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION		
L0305S	FLS	ASP	SD-203	0		

ADDITIONAL WATER DIVERSION



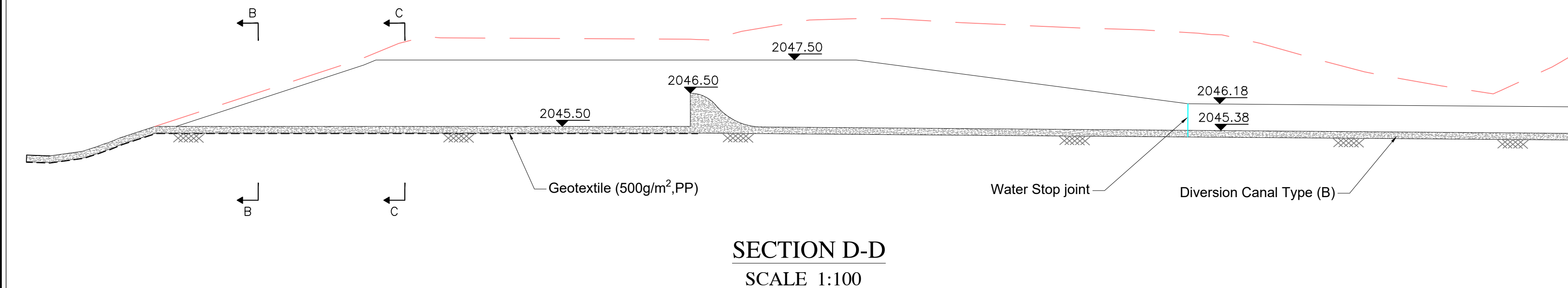
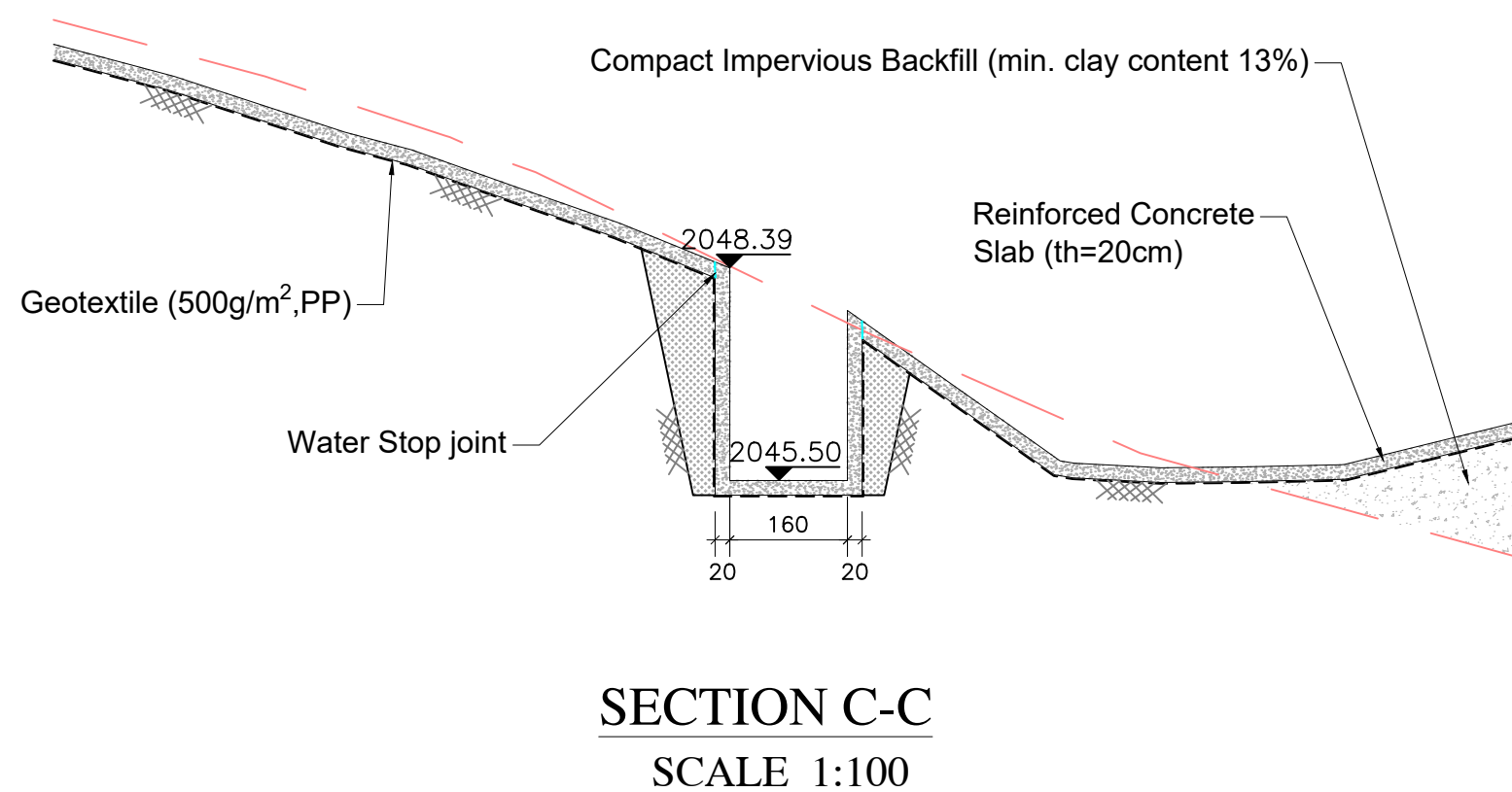
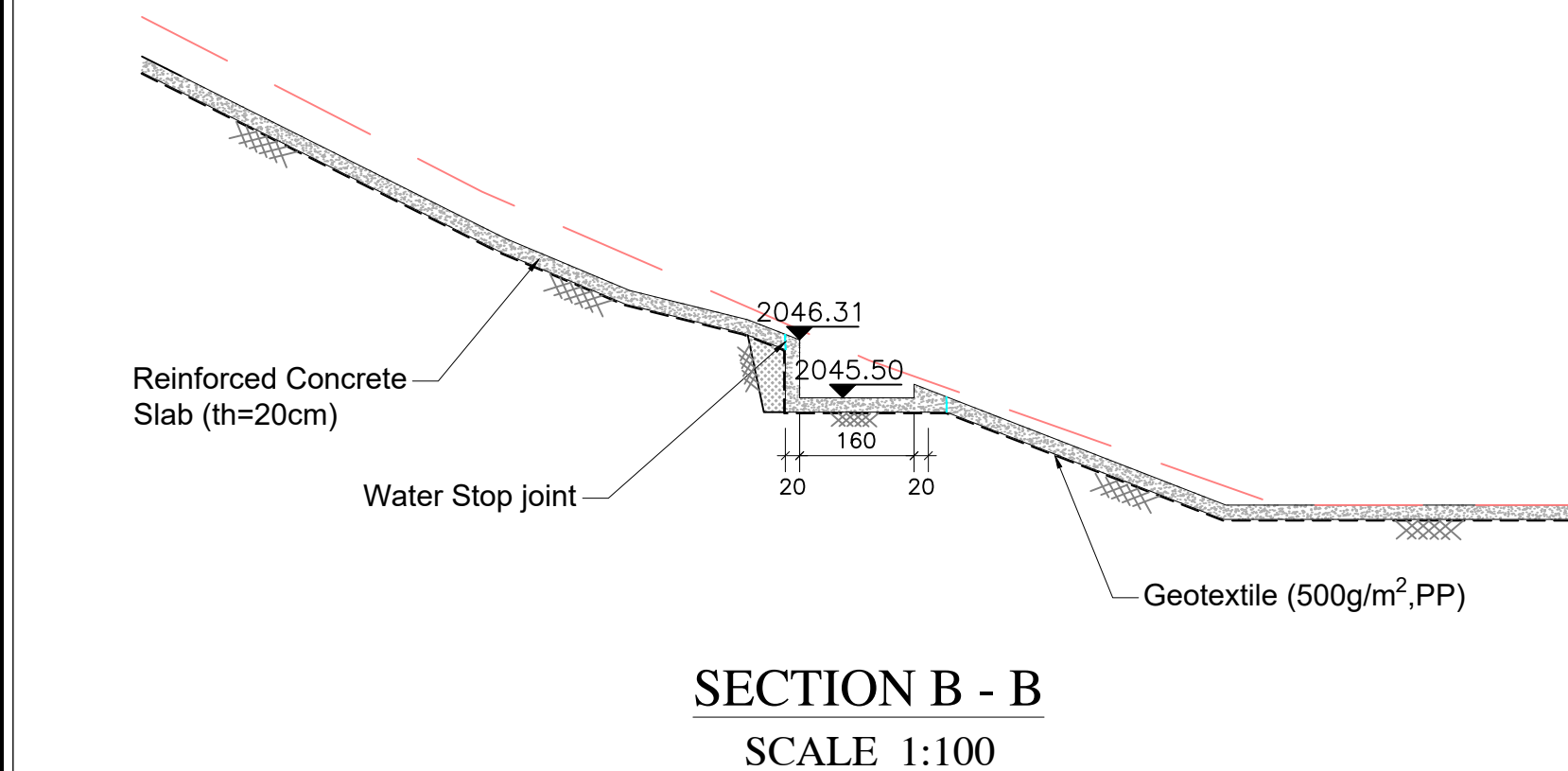
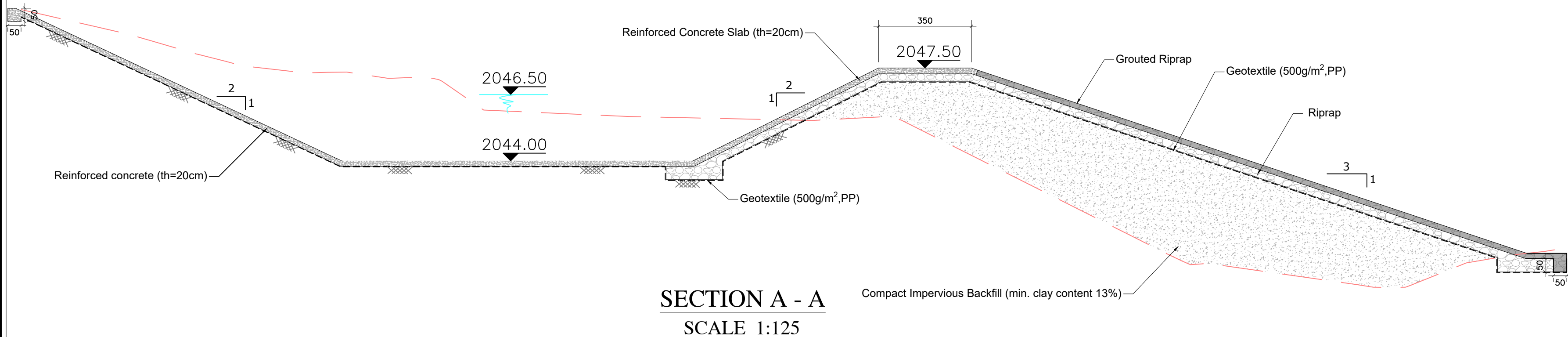
- LEGEND**
- Contour Line Every 5m.
 - Contour Line Every 1m.
 - Proposed Canal (Type A)
 - Proposed Canal (Type B)
 - Proposed Canal (Type C)
 - Existing Water Course

No	DATE	R E V I S I O N S			ARCH	CIVIL	MECH	ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION								
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION								
<div><div><div>DAR AL HANDASAH NAZIH TALES & PARTNERS دار الهندسة نزيه طالب وشركاه</div></div></div>								
ADDITIONAL WATER DIVERSION General Plan					DRAWN : -----			
					CHECKED : -----			
					APPROVED : -----			
					DATE : Jan 2024			
					SCALE : 1/2500			
					FILE NAME			
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PROJECT	DIVISION	SUB-DIVISION			SHEET	REVISION		
L0305S	AWD	GP			100	0		



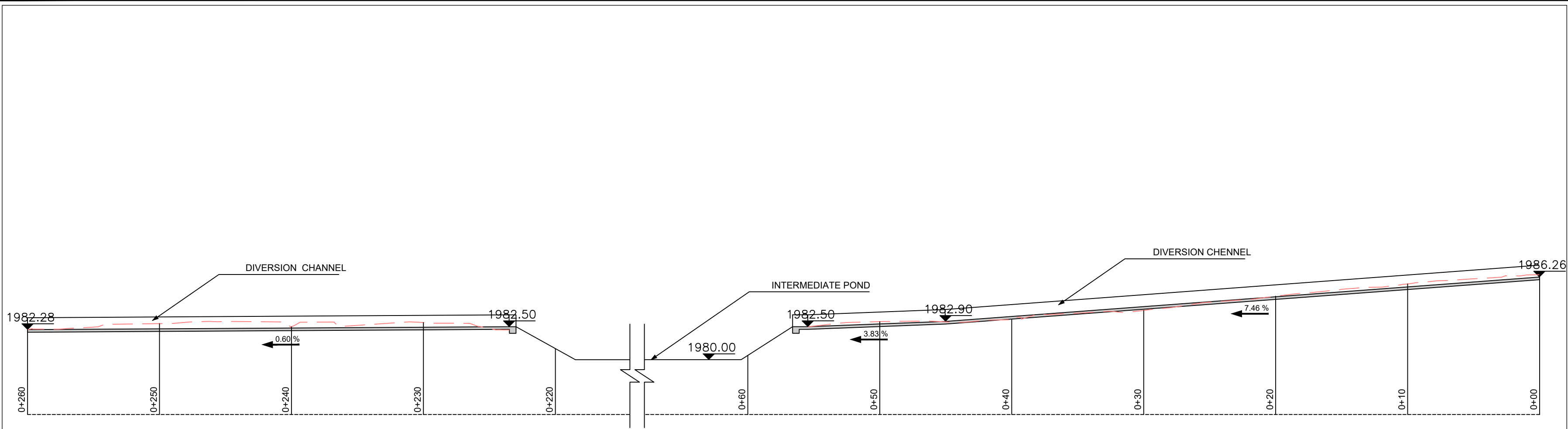
- LEGEND**
- CONTOUR LINE EVERY 5M.
 - CONTOUR LINE EVERY 1M.
 - PROPOSED CONTOUR
 - GROUTED RIP RAP
 - REFERENCE CONCRETE SLAB
 - NATURAL GROUND LEVEL
 - EXCAVATION LIMIT
 - FINISHED LEVEL
 - Existing Water Course
 - Proposed Canal (Type A)
 - Proposed Canal (Type B)
 - Proposed Canal (Type C)

No	DATE	R E V I S I O N S			ARCH	CIVIL	MECH	ELEC		
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION										
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION										
<div><div><div>Founded 1950</div></div><div>DAR AL HANDASAH NAZIH TALEB & PARTNERS دار الهندسة نزيه طالب وشركاه</div></div>										
ADDITIONAL WATER DIVERSION					DRAWN : -----					
					CHECKED : -----					
Upstream Diversion Dam Plan View					APPROVED : -----					
					DATE : Jan 2024					
					SCALE : 1/400					
					FILE NAME AWD-UDD-PV-101.dwg					
PROJECT			DIVISION		SUB-DIVISION		SHEET		REVISION	
L0305S			AWD		UDD		PV-101		0	

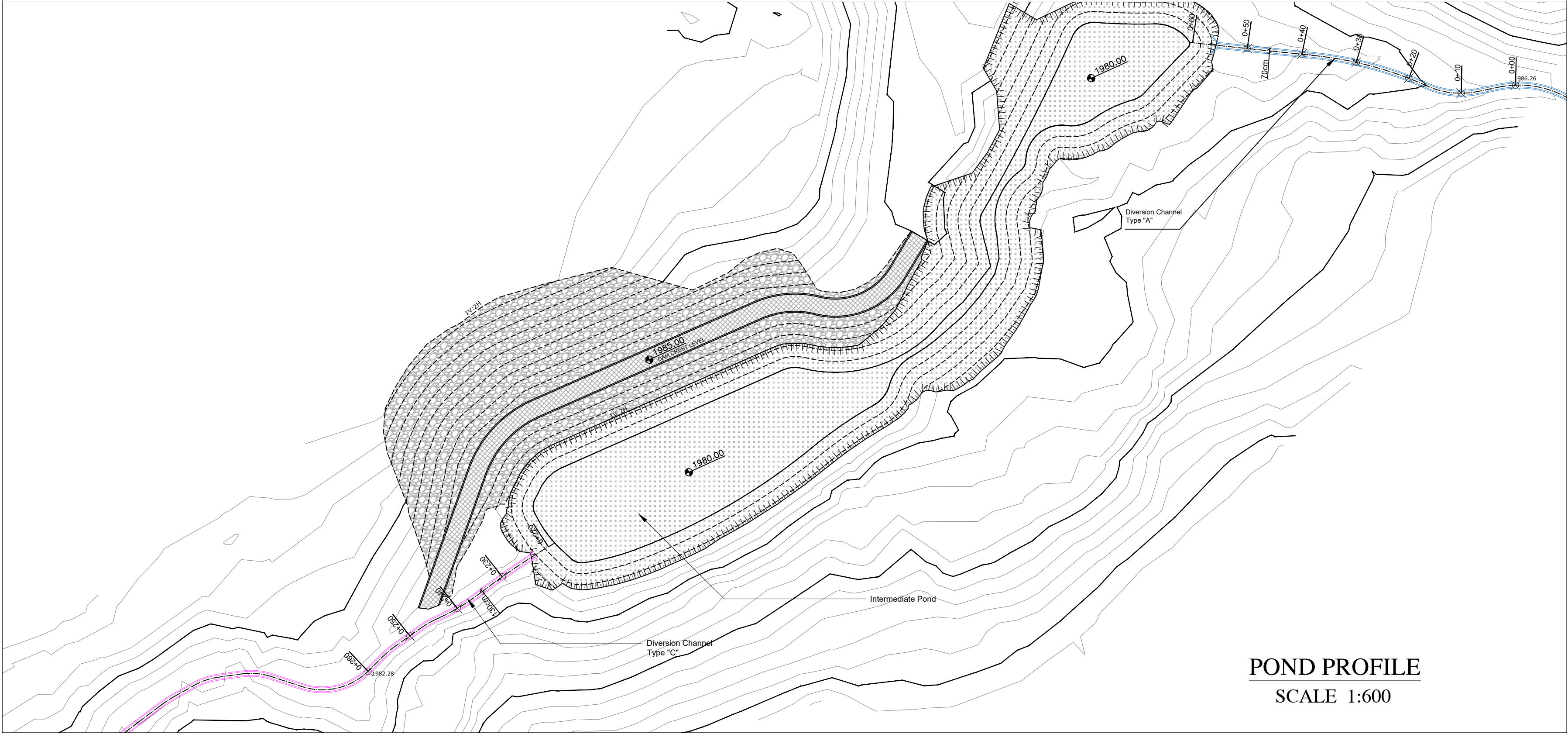


LEGEND	
	GROUTED RIP RAP
	COMPACT IMPERVIOUS BACKFILL
	REINFORCED CONCRETE
	SELECTED BACKFILL
	NATURAL GROUND LEVEL
	Geotextile (500g/m², PP)
	EXCAVATION LIMIT
	2044.00 FINISHED LEVEL
	WATER LEVEL

No	DATE	R E V I S I O N S				ARCH	CIVIL	MECH	ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION									
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION									
<div><div><div><div>DAR AL HANDASAH NAZH TALEB & PARTNERS</div><div>دار الهندسة نزيه طالب وشركاه</div><div>Founded 1980</div></div></div></div>									
ADDITIONAL WATER DIVERSION						DRAWN : ---			
						CHECKED : ---			
Upstream Diversion Dam Sections						APPROVED : ---			
						DATE : Jan 2024			
						SCALE : 1/125 1/100			
						FILE NAME			
						AWD-UDD-S-201.dwg			
PROJECT	DIVISION	SUB-DIVISION				SHEET	REVISION		
L0305S	AWD	UDD				S-201	0		



POND PROFILE
SCALE 1:250



POND PROFILE
SCALE 1:600

LEGEND

- CONTOUR LINE EVERY 5M.
- CONTOUR LINE EVERY 1M.
- PROPOSED CONTOUR
- GROUTED RIP RAP
- NATURAL GROUND LEVEL
- EXCAVATION LIMIT
- FINISHED LEVEL
- Existing Water Course
- Proposed Canal (Type A)
- Proposed Canal (Type B)
- Proposed Canal (Type C)

No	DATE	REVISIONS	ARCH	CIVIL	MECH	ELEC

REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT
AND RECONSTRUCTION

BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL
WATER DIVERSION

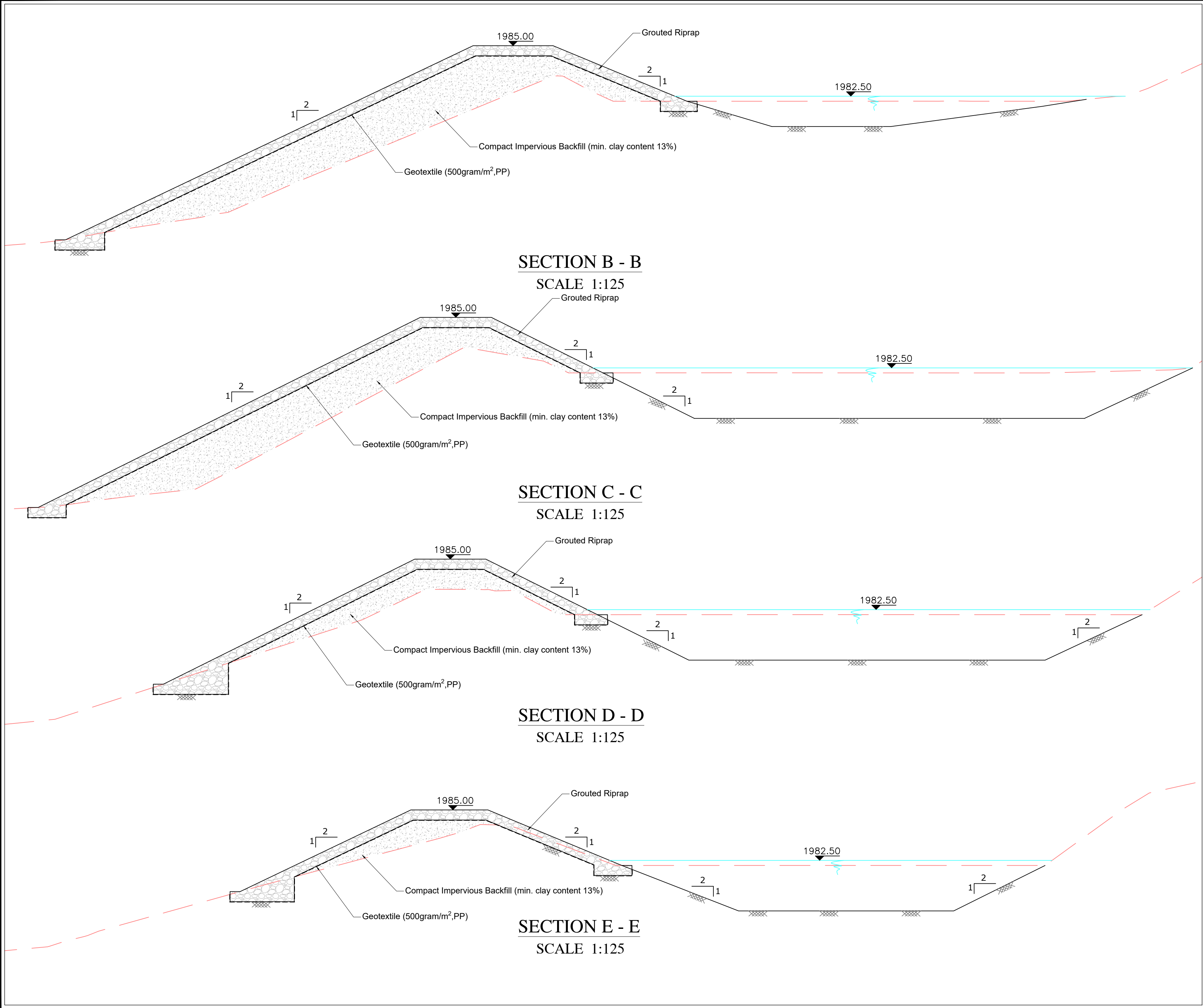
DAR AL HANDASAH NAZH TALES & PARTNERS
دار الهندسة نزيه طالب وشركاه

ADDITIONAL WATER
DIVERSION

Intermediate Pond
Plan Detail & Section

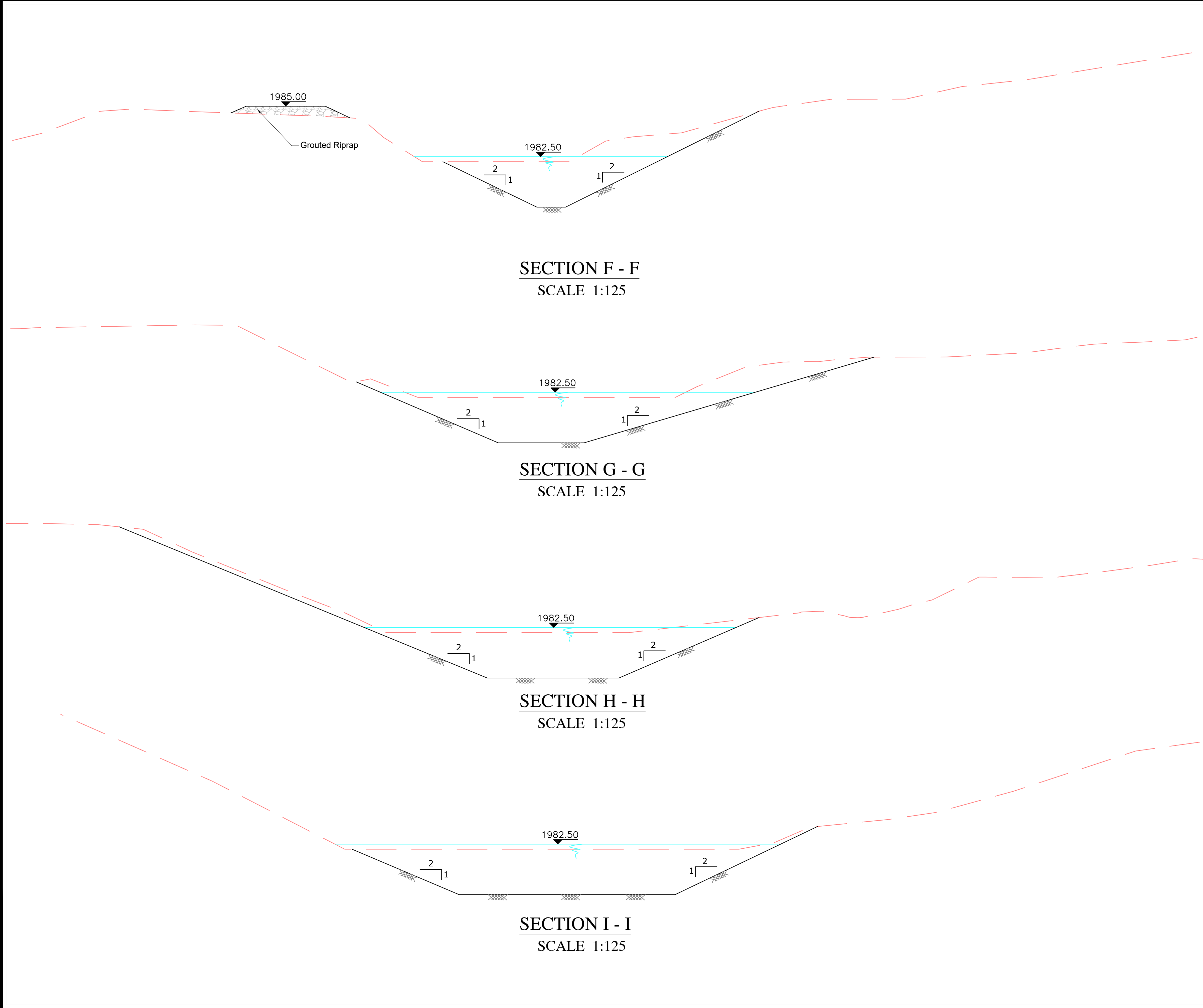
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION
L0305S	AWD	IP	S-202	0

DRAWN : ---
CHECKED : ---
APPROVED : ---
DATE : Jan 2024
SCALE : 1/250 1/600
FILE NAME
AWD-IP-S-202.dwg



- LEGEND**
- ROUTED RIP RAP
 - COMPACT IMPERVIOUS BACKFILL
 - REINFORCED CONCRETE
 - SELECTED BACKFILL
 - NATURAL GROUND LEVEL
 - EXCAVATION LIMIT
 - FINISHED LEVEL
 - WATER LEVEL

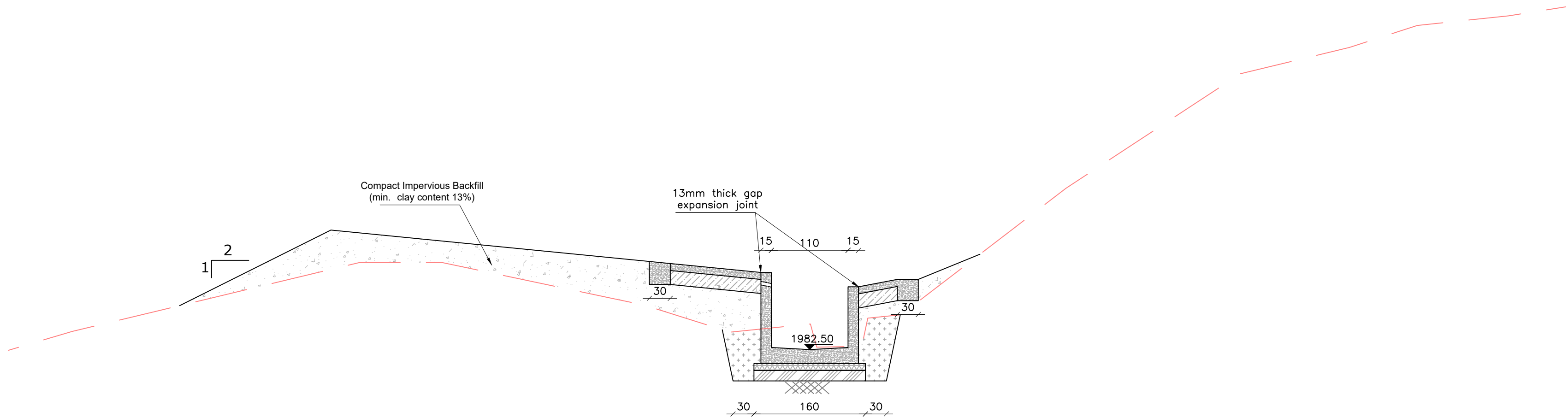
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<div>REPUBLIC OF LEBANON</div> <div>COUNCIL FOR DEVELOPMENT</div> <div>AND RECONSTRUCTION</div>									
<div>BRISSA DAM & RESERVOIR</div> <div>FULL LINING AND ADDITIONAL</div> <div>WATER DIVERSION</div>									
<div><div><div></div><div>Founded 1990</div></div><div>DAR AL HANDASAH NAZH TALES & PARTNERS</div><div>دار الهندسة نزيه طالب وشركاه</div></div>									
<div>ADDITIONAL WATER</div> <div>DIVERSION</div>					DRAWN : -----				
					CHECKED : -----				
					APPROVED : -----				
<div>Intermediate Pond</div> <div>Sections (1 / 3)</div>					DATE : Jan 2024				
					SCALE : 1/125				
					FILE NAME AWD-IP-S-203.dwg				
PROJECT	DIVISION	SUB-DIVISION			SHEET	REVISION			
L0305S	AWD	IP			S-203	0			



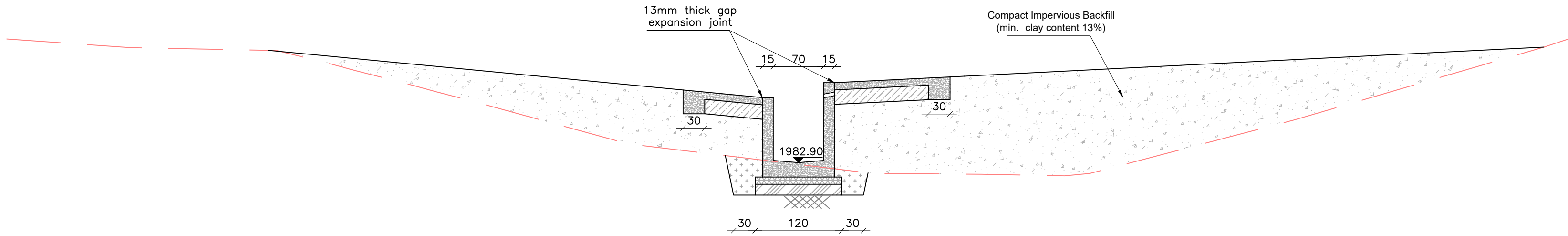
LEGEND

- Grouted Rip Rap
- Compact Impervious Backfill
- Reinforced Concrete
- Selected Backfill
- Natural Ground Level
- Excavation Limit
- Finished Level
- Water Level

No	DATE	R E V I S I O N S			ARCH	CIVIL	MECH	ELEC
<div>REPUBLIC OF LEBANON</div> <div>COUNCIL FOR DEVELOPMENT</div> <div>AND RECONSTRUCTION</div>								
<div>BRISSA DAM & RESERVOIR</div> <div>FULL LINING AND ADDITIONAL</div> <div>WATER DIVERSION</div>								
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<div>ADDITIONAL WATER</div> <div>DIVERSION</div>					DRAWN : -----			
					CHECKED : -----			
					APPROVED : -----			
					DATE : Jan 2024			
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					FILE NAME			
					AWD-IP-S-204.dwg			
PROJECT	DIVISION	SUB-DIVISION			SHEET	REVISION		
L0305S	AWD	IP			S-204	0		



SECTION A - A
SCALE 1:50



SECTION J - J
SCALE 1:50

LEGEND

- GROUTED RIP RAP
- COMPACT IMPERVIOUS BACKFILL
- REINFORCED CONCRETE
- SELECTED FILL OR BACKFILL
- 20 cm THICK COMPACTED SUBBASE COURSE
- 15 cm THICK COMPACTED BASE COURSE
- 10 cm BLINDING CONCRETE
- NATURAL GROUND LEVEL
- EXCAVATION LIMIT
- 2044.00 FINISHED LEVEL

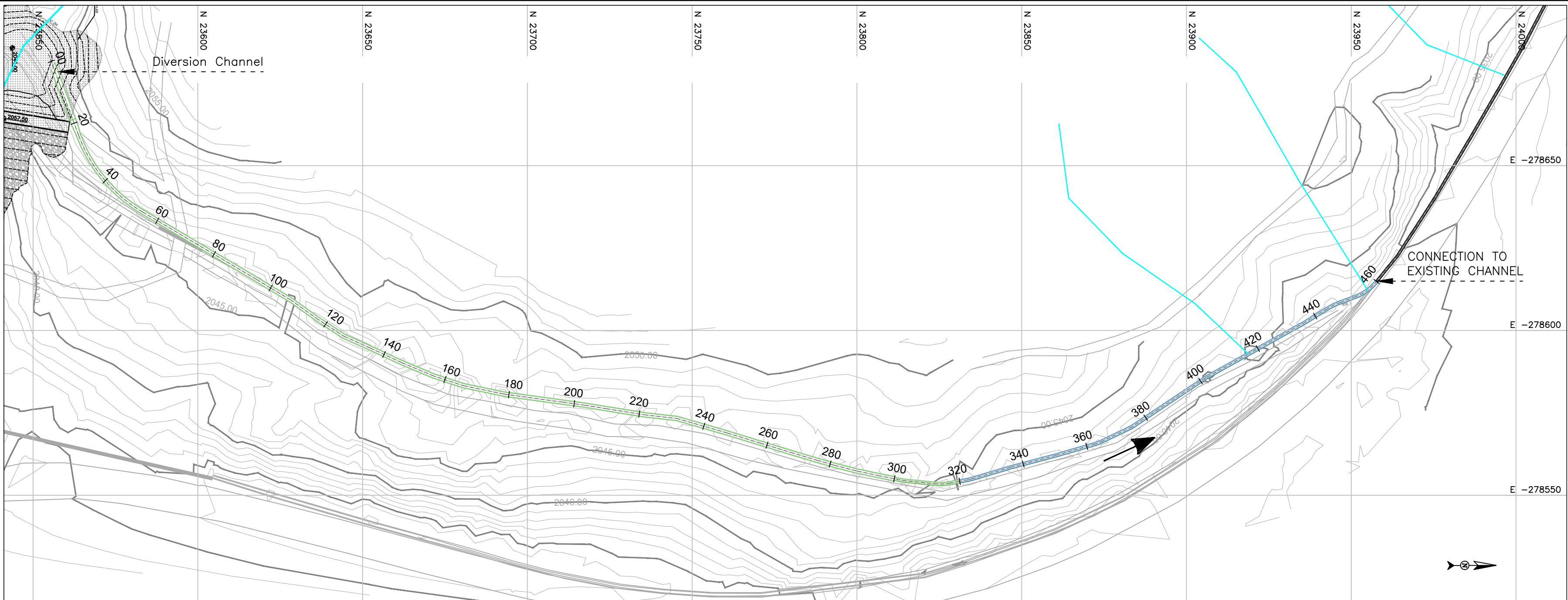
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REPUBLIC OF LEBANON
COUNCIL FOR DEVELOPMENT
AND RECONSTRUCTION

BRISSA DAM & RESERVOIR
FULL LINING AND ADDITIONAL
WATER DIVERSION

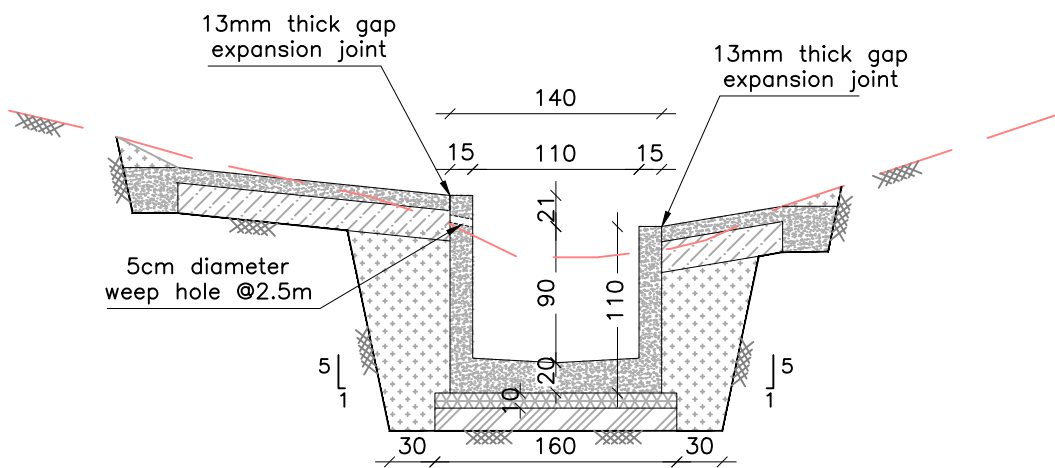
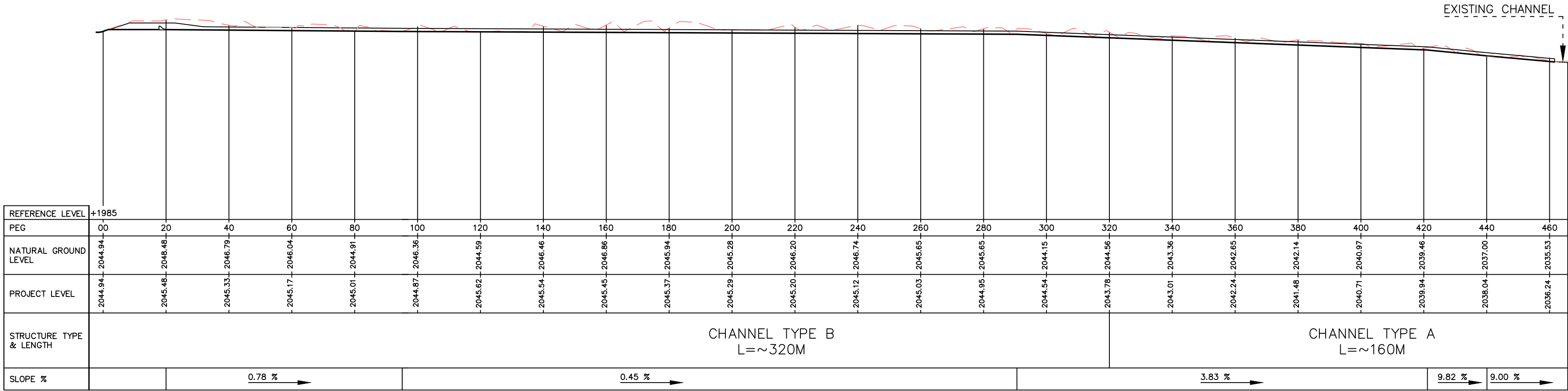
DAR AL HANDASAH NAZIH TALEB & PARTNERS
دار الهندسة نزيه طالب وشركاه

ADDITIONAL WATER DIVERSION	DRAWN : ---				
	CHECKED : ---				
	APPROVED : ---				
	DATE : Jan 2024				
Intermediate Pond Sections (3 / 3)	SCALE : 1/50				
	FILE NAME				
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	PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION
L0305S	AWD	IP	S-205	0	



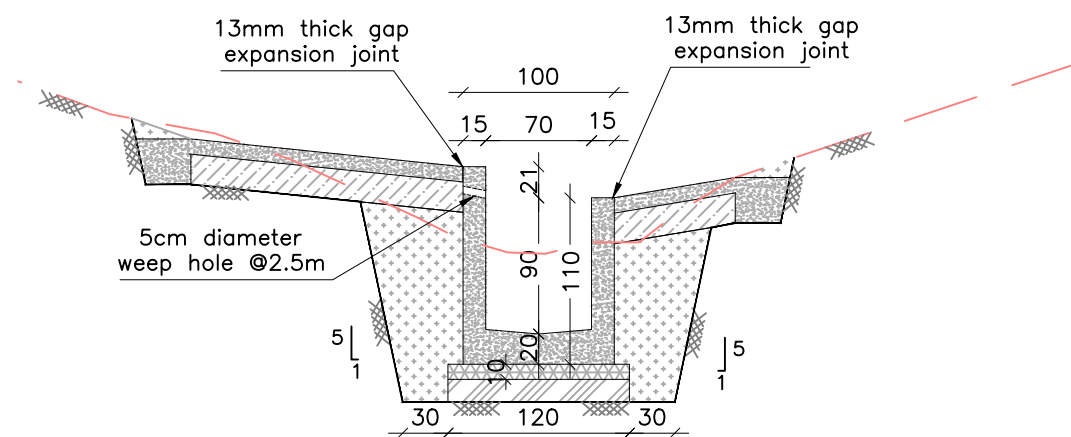
LEGEND

- Contour Line Every 5m.
- Contour Line Every 1m.
- Natural Ground Level
- Proposed Canal (Type A)
- Proposed Canal (Type B)
- Proposed Canal (Type C)
- Existing Water Course
- Finished Level
- Reinforced Concrete
- 10 Cm Blinding Concrete
- Selected Fill or Backfill
- 20 cm Thick Compacted Subbase Course
- 15 cm thick Compacted Base Course
- Excavation Limit



Channel Type " B "

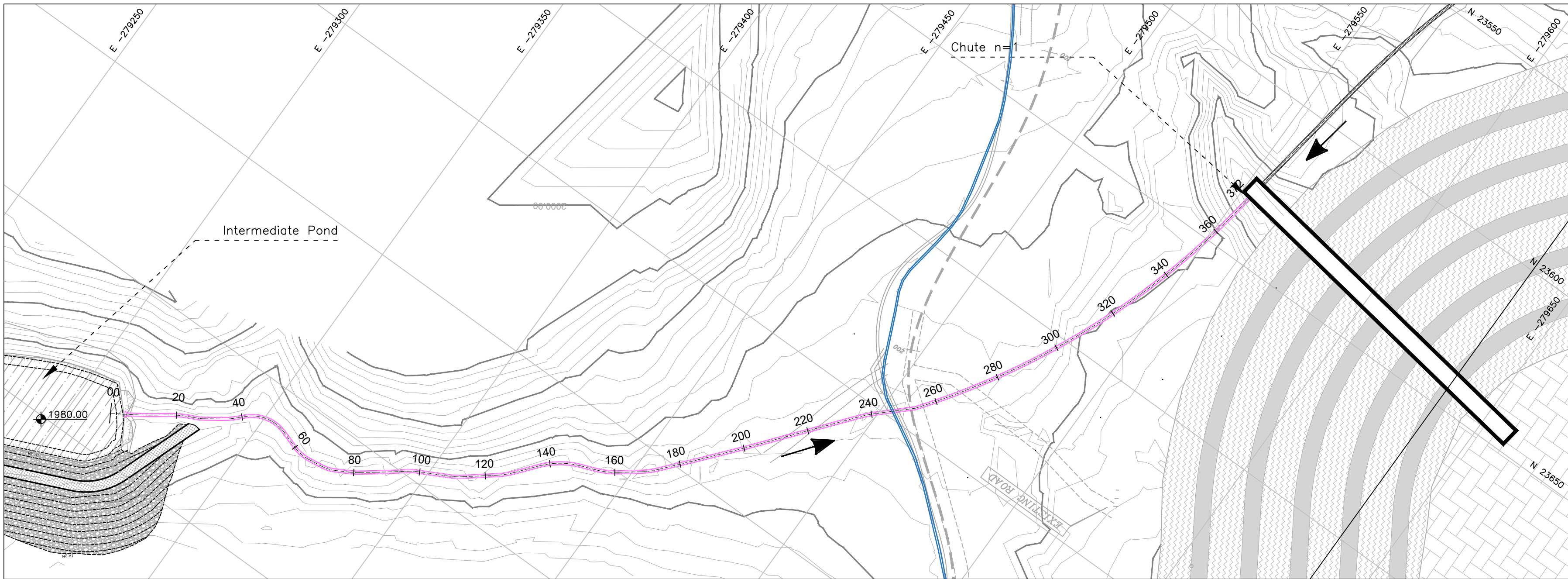
Sc:1/50



Channel Type " A "

Sc:1/50

No	DATE	R E V I S I O N S	ARCH	CIVIL	MECH	ELEC
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION						
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION						
DAR AL HANDASAH NAZIH TALES & PARTNERS دار الهندسة نزيه طالب وشركاه						
ADDITIONAL WATER DIVERSION			DRAWN : CHECKED : APPROVED : DATE : Jan 2024 SCALE : 1/1000			
From Diversion Dam To Existing Channel (1/2) Plan View, Profile and Sections			FILE NAME AWD-DS-101.dwg			
PROJECT	DIVISION	SUB-DIVISION	SHEET	REVISION		
L0305S	AWD	DS	101	0		



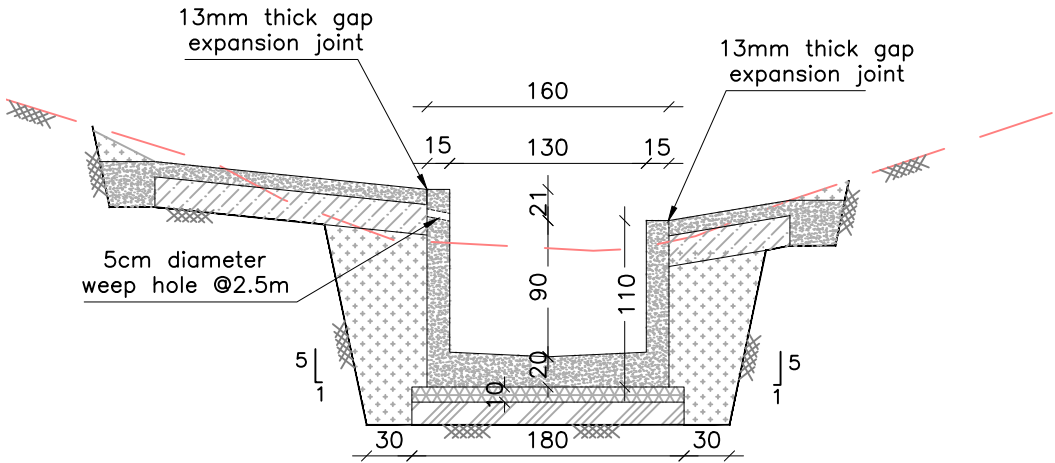
LEGEND

- Contour Line Every 5m.
- Contour Line Every 1m.
- Natural Ground Level
- Proposed Canal (Type A)
- Proposed Canal (Type B)
- Proposed Canal (Type C)
- Existing Water Course
- Finished Level
- Reinforced Concrete
- 10 Cm Blinding Concrete
- Selected Fill or Backfill
- 20 cm Thick Compacted Subbase Course
- 15 cm thick Compacted Base Course
- Excavation Limit

CONNECTION TO
INTERMEDIATE POND

CONNECTION TO
CHOUTE No1

REFERENCE LEVEL	+1945																
PEG	100	120	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320
NATURAL GROUND LEVEL	1982.26	1982.50	1982.35	1982.55	1982.38	1981.98	1982.71	1981.75	1981.80	1982.83	1981.33	1981.27	1981.49	1982.62	1983.14	1982.91	1979.86
PROJECT LEVEL	1980.00	1982.41	1982.29	1982.02	1981.84	1981.67	1981.49	1981.32	1981.14	1980.97	1980.79	1980.62	1980.44	1980.27	1980.09	1979.92	1979.75
STRUCTURE TYPE & LENGTH	CHANNEL TYPE C L=~370M																
SLOPE %	0.60 %		1.41 %		0.87 %												29.10 %



Channel Type " C "
Sc:1/50

No	DATE	R E V I S I O N S				ARCH	CIVIL	MECH	ELEC				
REPUBLIC OF LEBANON COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION													
BRISSA DAM & RESERVOIR FULL LINING AND ADDITIONAL WATER DIVERSION													
 DAR AL HANDASAH NAZH TALEM & PARTNERS دار الهندسة نزيه طالب وشركاه													
ADDITIONAL WATER DIVERSION						DRAWN : --- CHECKED : --- APPROVED : --- DATE : Jan 2024 SCALE : 1/1000							
From Intermediate Pond To Chute 1 Plan View ,Profile & Section						FILE NAME AWD-DS-103.dwg							
PROJECT	DIVISION	SUB-DIVISION		SHEET	REVISION								
L0305S	AWD	DS		103	0								